The Frank A. Ward Foundation of Natural Science

OF THE UNIVERSITY OF ROCHESTER

General Catalogue

for

HUMAN ANATOMY

COMPARATIVE ANATOMY

ZOOLOGY

ENTOMOLOGY

PALEONTOLOGY

GEOLOGY

MINERALOGY

WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.
84~102 College Avenue, Rochester, N.Y.

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To Our Customers

AS OF January 1, 1928, the ownership of Ward's Natural Science Establishment passed to the University of Rochester, the transfer being made as a gift for a memorial to Mr. Frank A. Ward, who for over fifty years, first as treasurer and then as president, had directed the affairs of the establishment.

The University Trustees accepted the gift and are continuing to carry on the establishment as a commercial institution, furnishing natural history material of all kinds to the scientific world. They assumed the responsibility entailed on them by the gift only after serious consideration, and they wish to have expressed here the reasons that decided them.

First: Letters which we have on file from various educational leaders convinced them that our work is of great value, and that there is at present no other firm in this country which could take our place.

Second: While at first glance it might seem undesirable to have a University closely connected with business, the point of view changes when the business is one chiefly concerned with supplying educational institutions with material that is essential to the proper functioning of those institutions.

Third: By a close relationship between the University and the establishment further aids to education could be developed—the teaching staff, with its knowledge of what is needed, furnishing ideas that our staff of expert technicians can carry out.

Furthermore, in taking over the ownership, it is not the intention of the University to conduct the establishment as a money making institution, but rather to make available to all such material as we supply at the lowest possible prices. The entire stock of the establishment was included in the gift, and no dividends will be taken out, nor will interest be charged on the original investment. If we find that our present prices are such as to allow a profit this money will be used to increase the stock, enabling us to offer to you still more material, at reduced prices.

On the other hand, the University feels that the establishment should be self supporting, and that it should not be asked to take any loss in connection with the gift. Accordingly our prices are based on cost plus overhead, with a small percentage added to create, if possible, a fund which can be used for the purchase of any fine collections that may appear on the market from time to time.

The University after accepting the gift, at once proceeded to show the policy it intends to pursue by sending Mr. George L. English, our mineralogist, on a trip around the world in quest of a larger stock of rare and beautiful minerals than could be obtained in any other way. This trip was completed last November, but the specimens secured are still coming in. Their total value is well over $100,000.00 and brings our stock of minerals up to the highest point in its history.

With the University's co-operation we have just secured thirty adult gorilla skulls, probably the largest series brought together at any one time, and we hope from time to time to announce further additions.

It is at its suggestion also that we have departed from our former practice of publishing only individual catalogues each covering but one department, and are issuing this more extensive publication, to acquaint the educational world with our present situation, and with the size and varied scope of the field covered by our stock.

This catalogue will be supplemented of course by other catalogues and price lists for the specialist.

During our seventy-five years of service we have gathered together a very great mass of material, and as a result have many rarities no longer obtainable, or obtainable only after long and expensive expeditions. Many of these are not listed here, but are contained in our special lists sent out from time to time to our customers.

Of these we might mention skins and skeletons of the Monotreme, Echidna aculeata, of the Giant Armadillo, of the Passenger Pigeon, a complete series of skeletons of the anthropoid apes, a skeleton of the Aye-aye, etc. In fact we have more than a thousand skeletons of various species for comparative osteology.

Of the beautiful land and marine shells we have more than a thousand species, and so can supply collections of large size, as well as rare species for addition to the collections already brought together.

Our entomological department is the largest in this country. It was started twenty years ago by the purchase of the American Entomological Company, and we have been adding to our stock ever since. We are still the only manufacturers of the genuine Schmidt insect boxes and the American Entomological Co. insect pins.

It is the wish of the University that we render service, and it is our aim to do this. If we can be of any assistance to you in any way we hope you will feel free to call upon us.

DIRECTIONS FOR ORDERING

IMPORTANT

PLEASE READ BEFORE MAKING OUT YOUR ORDER

How to Order

Please give both the catalogue number and the name of the specimen desired, so we will have no excuse for a mistake.

Shipment

Please state how you wish shipment to be made—parcel post, express, or freight. If no instructions are given we will use our best judgment.

Prices

As our prices do not include delivery, we do not prepay charges unless instructed to do so, when the prepaid charges are added to the bill. All of our prices are net f. o. b. Rochester, N. Y., with packing charged at cost. We have made this ruling, as it enables us to save you money when a number of articles are ordered, since the prices are made on the basis of the cost of the specimens, and nothing is added for packing except the actual cost.

Deliveries

Most of the material can be shipped within two days of receipt of order. When this cannot be done an acknowledgment of your order will be mailed to you at once, stating how soon we can ship.

Terms

Our terms to recognized educational institutions, our regular customers, and others who send satisfactory references, are thirty days net from date of invoice.

C. O. D. orders will be accepted from others only when a sufficient amount is prepaid to cover the packing and transportation charges both ways.

We do not open accounts for less than $5.00, so if ordering less than that amount please send sufficient to cover the material, packing and transportation. Any balance left over will be promptly returned to you.

Guarantee

All material sent out by us is sent with the understanding that if it is not satisfactory it may be returned at any time within ten days, and full credit will be allowed. We do not want you to have any of our material which is not entirely satisfactory.

Ward's Natural Science Establishment, Inc.

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SECTION I. MODELS

A. MODELS OF HUMAN ANATOMY

We are listing here a series of models which we hope will cover the needs of all educational institutions, except possibly schools of medicine. We have tried in each case to list two or more models of a kind, one a good elementary model at a low price, and one much more detailed for more advanced study.

The plaster models listed are made here and are always in stock. The papier mache models are imported from a very reliable European dealer, and while we try to keep them in stock, an unexpected demand sometimes leaves us temporarily short.

If you intend ordering a number of European models the price can be reduced by importing them to order, as in that case no duty is assessed, and a saving of from 15% to 20% is made; but nearly two months are required for delivery.

COMPLETE FIGURES

HO–1

HL–1

HO–1. Male Figure, life size. "Exact representation of all the muscles, arteries, veins and nerves; can be disarticulated into many parts. This allows all anatomically essential parts of the human body to be demonstrated. This model shows all the details, which are represented on separate models of the same dimensions. It is made from numerous natural preparations of the anatomy at Leipzig, and from valuable information secured from the preparator of that institute, Mr. C. Hagedorn, so that anatomical correctness can be guaranteed. This model makes the purchase of part-models superfluous, and its acquisition can be recommended in all cases where the cost is not too great, and where a perfect representation of the anatomy of the human being is desirable."

Price, for duty free importation $375.00
Price, duty paid 450.00

HL–1. Female Figure, life size, upright on a rotary base. The right half of the body shows the muscles, arteries, veins and nerves. The head can be disarticulated, and the brain can be taken out and disarticulated into many parts. The arms, and the covering for thorax and abdomen can be taken off. The interior organs: lungs, heart, liver, stomach, small intestine, large intestine and uterus, can be taken out and disarticulated. The blind-gut can be opened; the urinary and the sexual apparatus are well represented; the mammary gland can also be disarticulated. The model without the base is five and one half feet in height; it is modeled after numerous natural preparations, and its scientific exactness is fully equal to that of the previous model.

Price, for duty free importation $350.00
Price, duty paid 425.00

N.B.—The above are the two best manikins of German manufacture, and are recommended by us as the best for the price.

We can also furnish the Auzoux manikins, which are however much more expensive. We will gladly quote prices upon request.

TORSOS

HK–1

HK–2

HK–1. Trunk with Head, life size, upright on base. One half of the brain can be taken out; the lobes of the lungs with the anterior ribs are removable; all the intestines can be taken out; and the blind-gut can be opened. A new model.

Price, for duty free importation $85.00
Price, duty paid 95.00

HK–2. Trunk, without Head, of a youth about twenty years of age, upright. All intestines can be taken out; the heart cannot be disarticulated.

Price, for duty free importation $37.50
Price, duty paid 42.50

H–201. Half Head.

HL–2. Female Trunk, without Head. Size and style same as previous model. The heart is made to open. Of the pelvic organs the uterus can be taken out and disarticulated. The ovaries are represented in their exact topographic position. The exterior genitals are not visible.
Price, for duty free importation, $40.00
Price, duty paid 45.00

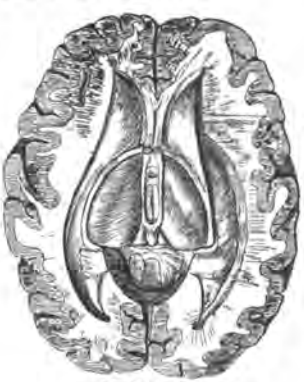
HEADS

H–201. Model of vertical section of head, natural size, on wooden plaque, showing the bones of the skull as well as the cranial cavities, cerebrum, cerebellum, spinal cord, nasal septum, larynx, tongue, palate, oesphagus, etc.
Price $8.00

H–202. Model of half head, natural size, on wooden plaque. The superficial muscles, arteries, veins, nerves and glands are well shown. The model also shows the neck down to the clavicle.
Price $15.00

BRAIN AND NERVOUS SYSTEM

HB–1



H–215-C

HB–1. Brain, natural size; can be vertically disarticulated, and consists of two parts, with medulla oblongata. Modeled after natural preparations.
Price $7.50

HB–3a. Brain, natural size, eight parts; can be disarticulated, showing all the essential details. A new model, in every respect commendable; modeled from natural preparations.
Price $17.50

HB–7. Brain, double the natural size; can be separated into many parts. The issuing forth of the nerves, as well as the ramification of the cerebral arteries and the whole course of these, are represented. A first class model; made from natural preparations.
Price, for duty free importation $47.50
Price, duty paid 52.50

H–215. Sections of brain, very greatly enlarged. Set of five models for class room demonstration. Each model is mounted on an ebonized wooden panel. The set contains—
A. Lateral exterior of brain.
B. Anterior and posterior sections of brain.
C.–D. Horizontal sections, one superior and one inferior.
E. Transverse section of brain.
Price, $12.50 each. Set for $50.00

H–215-A

H–215-B

HB–8. Central and peripheral nervous system, on board, schematically represented. It shows the brain, the spinal marrow, and the ramifications of the nerve cords.
Price $15.00

HB–10. Two models. The origins of the nerves in the spinal marrow are represented in a ten-fold enlargement (after drawings by Prof. Spalteholz). These two models give a distinct view of how the nerves, in most slender fiber-bundles, originate within the gray substance of the spinal marrow, pass through the white substance, and then combine to form common nerve-cords. The posterior roots are the nerves of feeling, while the anterior roots are the motors.
Price $10.00

H–218. Section of spinal cord, greatly enlarged, showing origin of the spinal nerves and their ganglia. A typical cross section. A very useful model.
Price $12.00

H–243. Spinal cord, complete. A life size model, showing cerebellum, spinal cord and nerves; and the sympathetic nervous system on the right side.
Price $40.00

H–218

ORGAN OF SIGHT

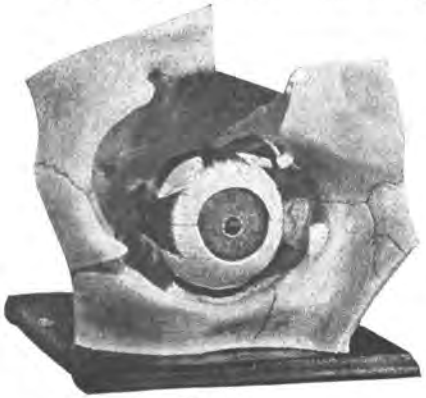
HC–11

HC–1. Eyeball, on standard. Three times enlarged, with insertion of muscles. Can be divided into cutis vera, choroid membrane, vitreous humor, and the lens.
Price $8.00

HC–11. Eye on one part of orbit, with all the muscles, arteries and nerves. Can be completely dissected. A fine model.
Price $45.00

HC–12. Eye, five-fold linear enlargement. The osseous orbit is vertically dissected, with all the muscles, arteries and nerves, which are laid bare. Beneath the contractor, which can be taken off, the lachrymal apparatus is represented. A very instructive model. Not carried in stock.

Price, for duty free importation, $60.00



HC–13

HC–13. Eye, three times enlarged, perfectly embedded in the bones of the orbit, with all the muscles. The upper straight muscle may be removed. The model may be taken apart. We recommend this model.

Price $20.00

HC–1

Model of Eye

H–213. Vertical section of eye, greatly enlarged. The entire anatomy of this important organ is clearly shown; the muscles, optic nerve and sheath, lens, iris, cornea, bones of orbit, ciliary body and muscle, sclerotic, choroid, retina, etc. No removable parts, but all parts clearly shown. Mounted on ebonized panel, 16½ in. x 19½ in.

Price $15.00

ORGAN OF HEARING

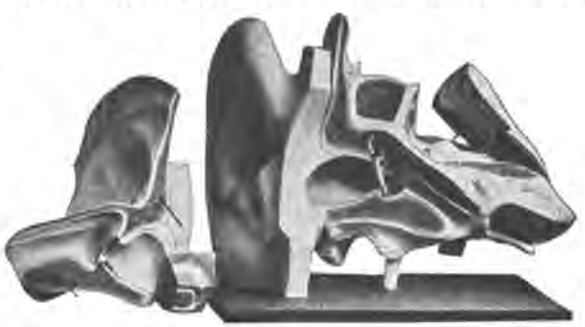
HD–2

HD–2. Ear, three times enlarged, with the shell of the ear. Can be disarticulated into labyrinth, incus, malleus, stapes, and membrane of the tympanum. These parts can be taken out. A very useful model, at a low price.

Price $13.50

HD–13. Ear, five times enlarged, on stand; modeled after natural preparations. The model shows the shell, the opened auditory passage, the exact position of the membrane of the tympanum with the three auditory ossicles, the middle-ear and its connection with the cells of the mastoid process; the hollow spaces of the semi-circular canal and of the cochlea are also visible. This model is scientifically made throughout. The musculus tensor tympani and musculus stapedius, as well as the nervus acusticus and the nervus facialis are represented. This model can be dis-articulated and allows an exact view of the whole topography of the ear. It is specially recommended to physicians and universities. Not carried in stock.

Price, for duty free importation, $50.00



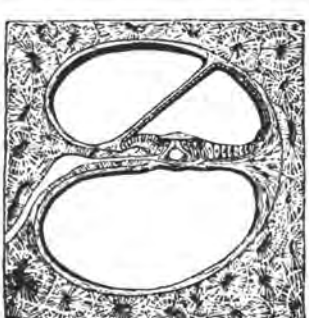
HD–13

HD–15. Ear, without conch, four times enlarged, modeled after natural preparations. By taking off the tegmen tympani, one gets a clear view of the middle-ear and the interior ear (cochlea and labyrinth). A vertical section through the tympanic cavity divides this model into two parts, so that the membrane of the tympanum with the auditory ossicles on one part, the cochlea with the semi-circular canals on the other part, are visible in their respective natural positions.

Price $20.00

H–214. Ear (13½ inches long), with portion of external conch. Separable into four parts. Shows clearly auditory ossicles, the tympanum and labyrinth, the ampullae, cochlea, and branching of auditory nerves. A good model for school use.

Price $12.00



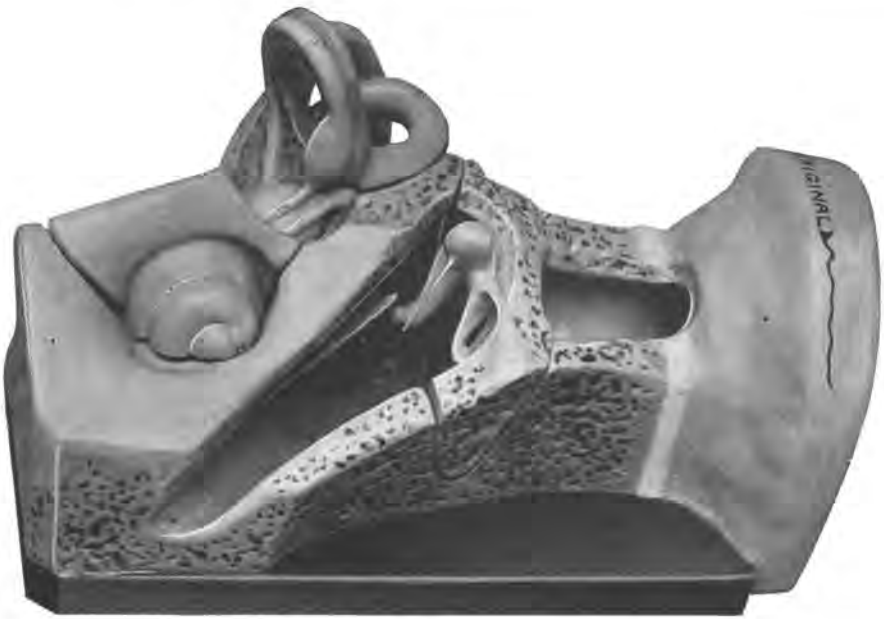
H–242. Section of Cochlea.

H–242. Section of Cochlea (greatly enlarged.) 11½ x 11½ inches. This model shows the surrounding bony wall, the walls of the scala vestibuli, scala tympani, and of the collaterals; all the microscopic details of this very essential portion of the ear; auditory nerve ending, auditory cells, basilar membrane, organ of Corti, etc. Complete with wooden base and explanatory diagram.

Price $10.00

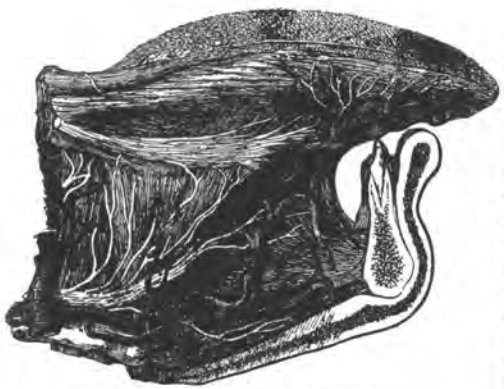
HD–11. The three auditory bones, greatly enlarged. The model can be disarticulated.

Price $7.50



H–214. **Model of Ear.** (See page 6.)

ORGANS OF SMELL AND TASTE



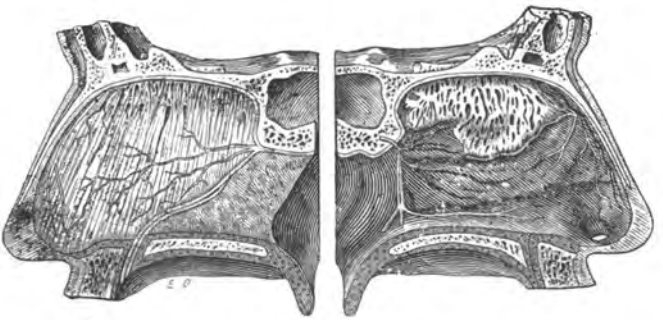
H–206. Tongue. Right Side.

H–206. Tongue, greatly enlarged. A model of the bisected tongue, mounted on revolving standard. The tongue is represented cut longitudinally, exposing the fibrous septum and diverging muscular fibers. On the upper side is seen the mucous membrane prolonged to the fraenum, covered by the circumvallatae, the fungiformes, filiformes, follicles and nerves. On the external side is seen the base of this organ; also the two nerve fasciculae, one commanding the gustative functions, the other excited by conditions of dryness and moisture of the organ. Mounted on standard on pedestal. Size 15 inches long, 12 inches high.

Price $15.00

H–207. Circumvallate Papillae of the Tongue. Median section greatly enlarged. Shows the papillae, the sulcus and ridge surrounding it, the various layers of which it is composed, epithelium, skin, fibrous and muscular layers, and all the microscopic details of the organ of taste—pores, taste corpuscles, nerves ending in the organ, tactile corpuscles, mucous glands, etc. Dimensions, 8¼ inches x 8¼ inches. Mounted on pedestal.

Price $15.00



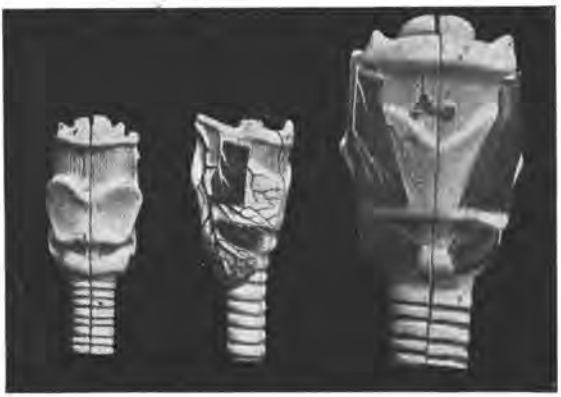
H–212. **Median Cut of Enlarged Nose.**

H–212. Median section of nose. Two sections made by a cut at one side of the nasal septum, showing all details clearly.

Price $15.00

H–207. **Papillae of Tongue.** (See page 7.)

ORGAN OF SPEECH (THE LARYNX)



HH–1 HH–3 HH–6

HH–1. Larynx, natural size, separating into two halves.

Price $5.00

HH–3. Larynx, natural size, with muscles, thyroid gland, arteries and veins. Can be separated into two halves.

Price $7.00

HH–5. Larynx, with tongue, natural size, with part of lower jaw. Can be separated into five parts.

H–241

Price $13.50

HH–6. Larynx, double natural size, can be disarticulated into five parts; the muscles are removable; arteries and veins are shown. A fine model for physicians.

Price $12.00

HH–11. Larynx, 2½ times enlarged representation of the cartilage trestle and the tongue-bone. The adjusting cartilages with the vocal ligaments are movable through a contrivance for pulling, so that the glottis can be widened and straightened.

Price $15.00

H–241. Larynx, greatly enlarged, mounted on wooden base. The organ is shown with the blood vessels and the nerves opening on the median line. By means of this model the action of the vocal cords may be easily demonstrated.

Price $16.00

TEETH

HE–10

HE–10. Teeth, eight times enlarged—

a. Incisors, separating into two parts. Price $6.00
b. Canine, separating into two parts. Price 6.00
c. Molar with one root (pre-molar). Price 3.00
d. Grinder with two roots (Molar), from lower jaw. Shows caries; separating into two parts. Price 5.00
e. Grinder with three roots (Molar), separating into three parts. Price ... 7.50

Price of complete set $25.00

HE–12. Upper and lower jaw of child about five years old, movable, opened at one side so that the course of the blood vessels and the nerves are to be seen. On the milk teeth the times of their breaking through are marked in months, on the second teeth in years by the respective ciphers. Double the size.

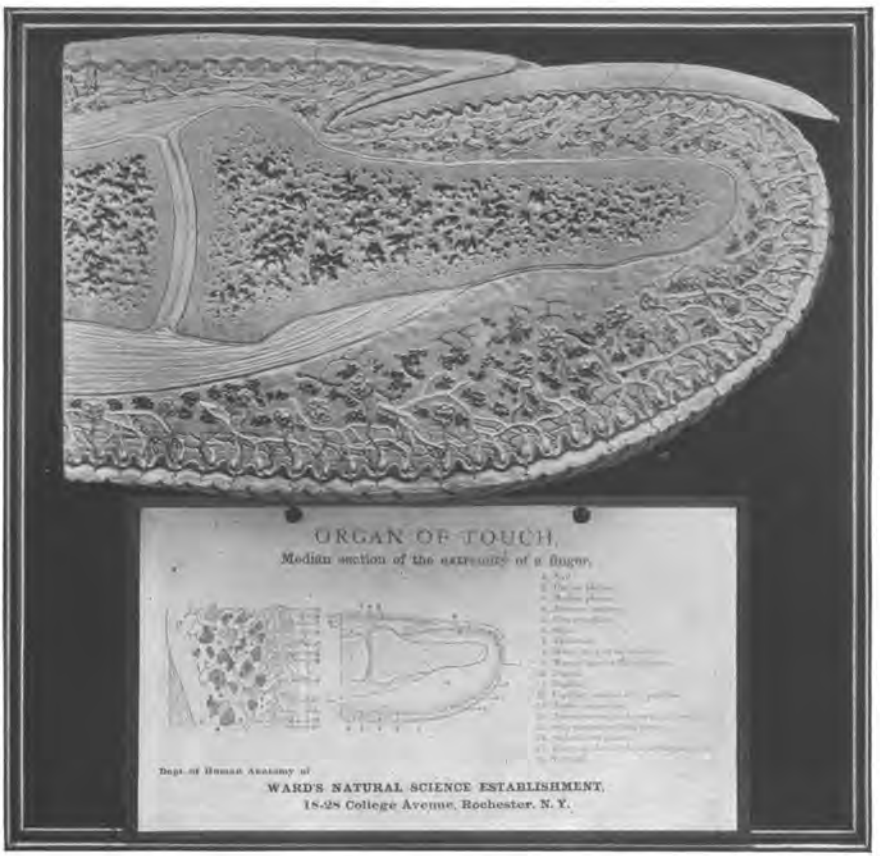
Price $25.00

HE–12

H–205. Lower jaw, enlarged model. It shows two incisors, one canine, two pre-molars, and three molars; showing development and decay.

Price $8.50

THE SKIN



H–222. Model of Organ of Touch.

H–222. Section through Tip of Finger, greatly enlarged, showing the successive layers of the skin, capillary vessels, nerves, tactile corpuscles, sudoriferous glands, etc. Mounted on ebonized pedestal. Dimensions 9½ in. x 12½ in.

Price $15.00

H–223. Vertical section through the skin, 200 times enlarged, showing the three principal layers, sebaceous and sweat glands, hair roots, muscles, arteries and veins.

Price $7.50

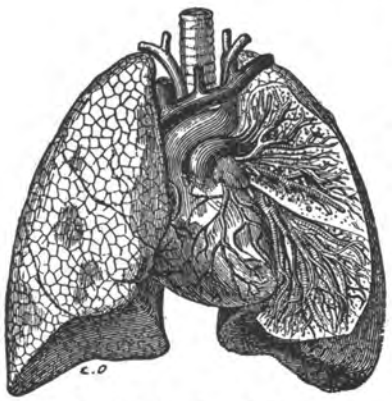
H–225. Section of the skin of the palm of the hand, showing the circulation, nerves, tactile corpuscles, etc. Two pieces on plaque, 20 by 16 cm.

Price $7.50

H–226. Model of hand, 15 inches high, on pedestal. The skin is removed; the lateral fingers show the muscular layer, the tendons, arteries, veins and nerves. On the middle finger is left the layer of adipose tissue, the network of subcuticular blood vessels, and the nervous plexus of the pulp.

Price $15.00

HEART AND LUNGS



H–244. Heart and Lungs.

H–244. Model of heart and lungs. The lungs are shown with the heart in the natural position. On the anterior side of the left lung a section has been made showing the bronchi, the arteries and veins; on the posterior face a section of the right lung shows the base of the tracheal artery, the bronchi and their branches, as well as the veins and arteries that penetrate the lung. The model is life size, and is mounted on a wooden base with full descriptive key.

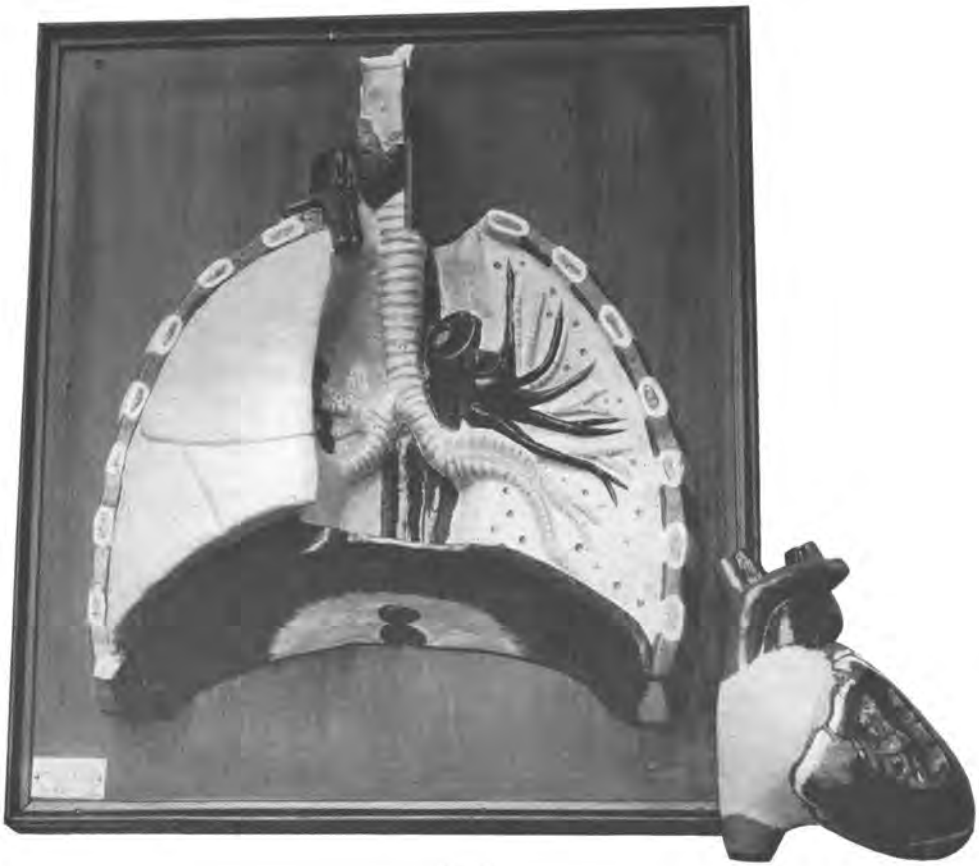
Price $20.00

H–246. Heart, lungs and larynx, made of plaster composition and mounted on ebonized panel. (See cut).

Price $20.00

HJ–2. Heart, natural size; ventricles can be opened.

Price $6.50



H–246

HJ–6

HJ–12

HJ–6. Heart, enlarged, on stand, with arteries and veins. Ventricles and auricles open.

Price $17.50

H–232. Heart, greatly enlarged, on panel. The body wall removes, exposing the auricles, ventricles, valves, etc. The largest low-priced model made.

Price $15.00

HJ–12. Circulation of blood, schematically represented, on board, $\frac{2}{3}$ natural size.

Price $15.00

HJ–21. Seven hearts of vertebrate animals, viz.: of a fish, a frog, a tortoise, a crocodile, a bird, a mammal, and of a human being. These models have been made at the Anatomical Establishment of Jena after natural preparations. The hearts of the first five species are several times enlarged in order to render the details more conspicuous. This collection of the seven most essential types of the heart are excellent objects for teaching the evolution of the heart from the fish up to the human being; they show the variety of their respective forms and structures. Model not carried in stock.

Price, for duty free importation $45.00

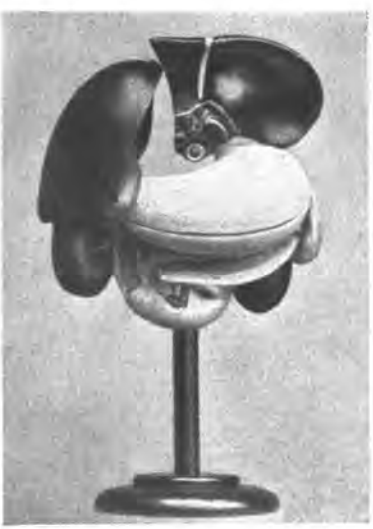
DIGESTIVE ORGANS

H–240. Model of digestive system, on plaque, with full descriptive label, a very careful piece of work, showing clearly the entire digestive system. This is a new model.

Price $18.00

HN–11. Stomach with duodenum, milt, and pancreatic gland in exactly topographic position. The pancreatic gland and the liver with gall bladder show their excretory ducts into the duodenum.

Price $15.00

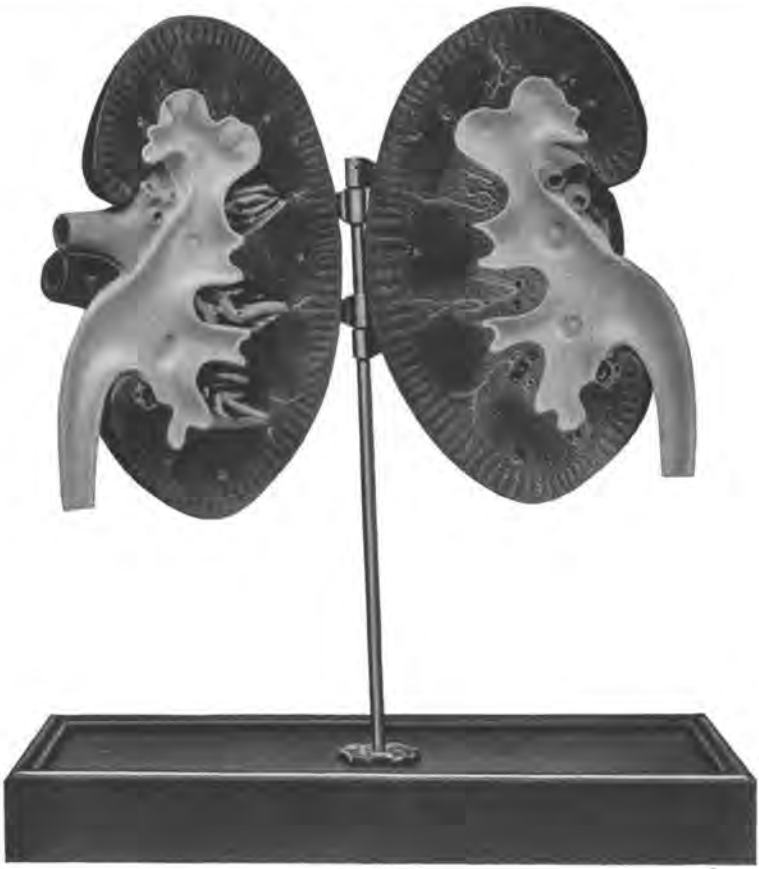


HN–11

H–240

H–229. Kidney, 8½ inches by 6 inches, mounted on ebonized standard with hinged support. The complete anatomy of this excretory gland is clearly shown, the renal artery and vein, the ureter, the pelvis, the pyramids of Malpighi, the columns of Butin, etc.

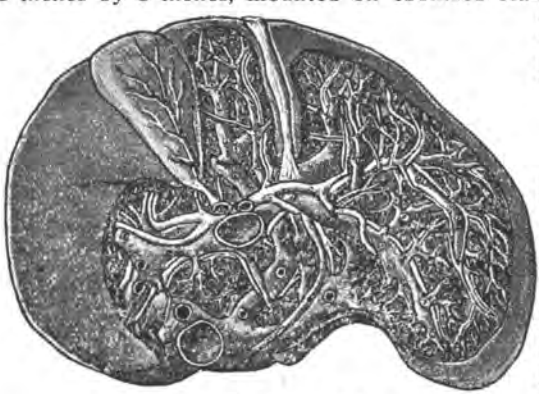
Price $15.00



H–229. Kidney.

H–230. Model of Intestinal Villi. Two intestinal villi are represented in a model 8 inches by 8 inches, mounted on ebonized standard. It shows on two surfaces the circulatory system of these organs, the veins and arteries leading to the periphery of these villi, and the lymphatic vessels. (See cut, page 16.)

Price $8.00

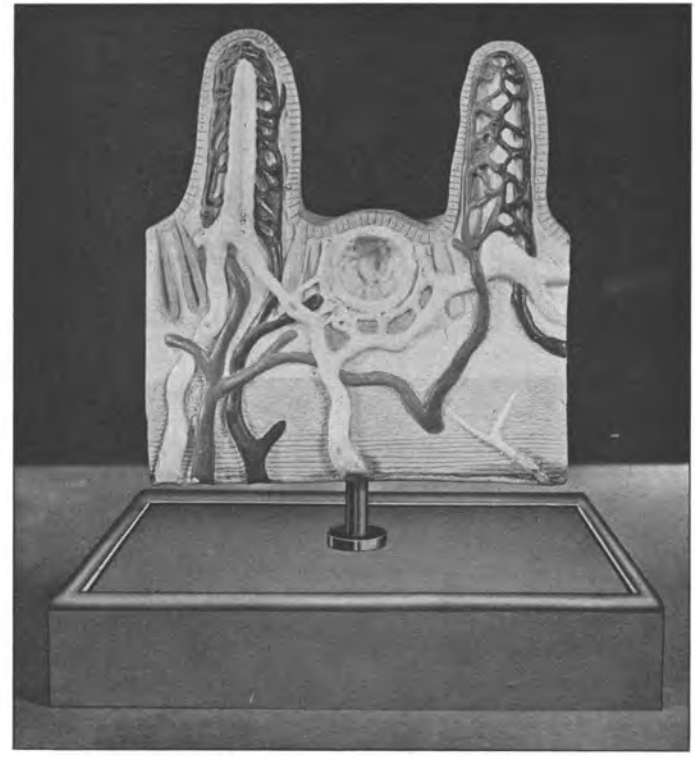


H–245. Model of Liver.

H–245. Model of Liver. This model, of natural size, represents the liver dissected on the inferior side. It shows the circulation of the portal vein, the hepatic veins and arteries, the biliary canals, the atrophied umbilical vein, the gall bladder, cystid ducts, hepatic ducts, and the opening of the common bile duct. A very complete and satisfactory model for the study of this important organ. Mounted on wooden pedestal.

Price $15.00

H–247. Female Pelvis. (See page 17.)



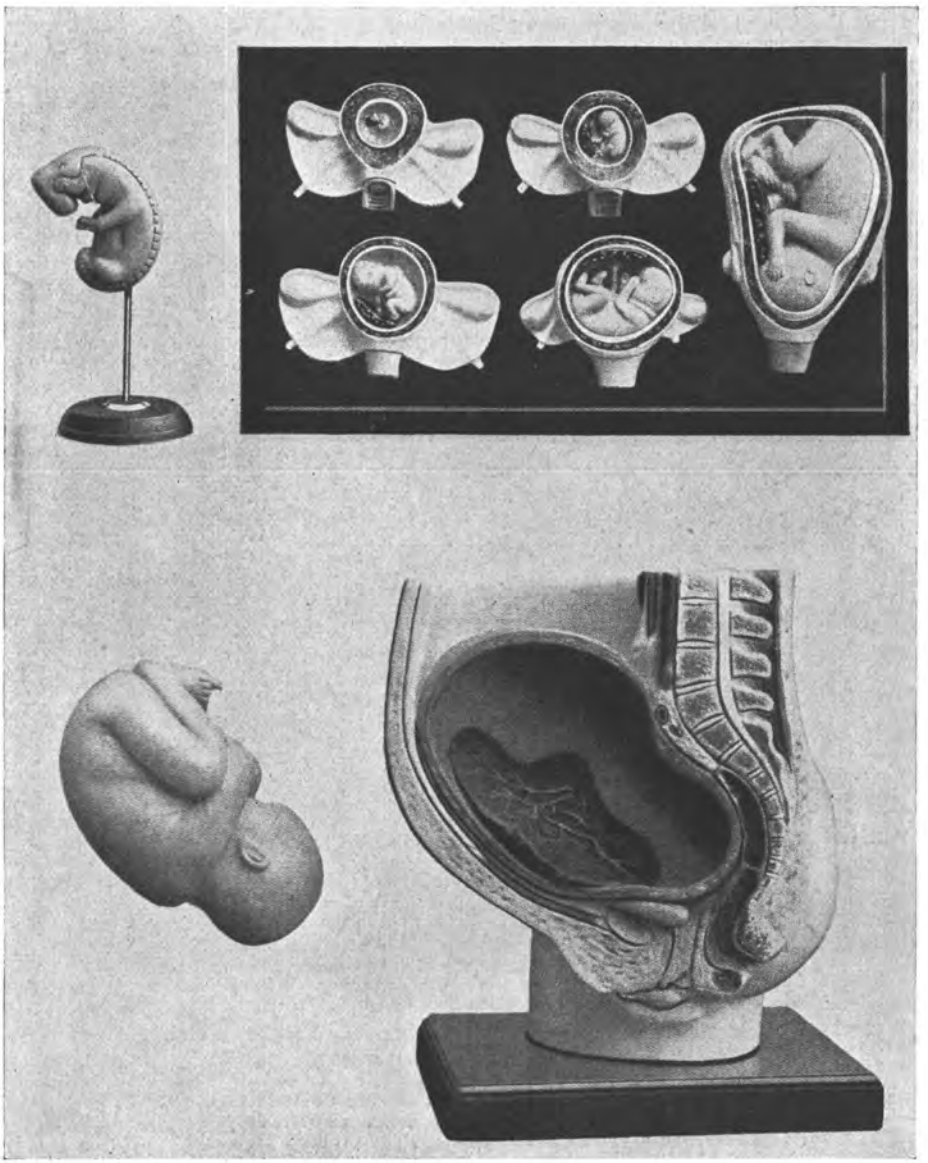
H–230. Model of Intestinal Villi. (See page 15.)

REPRODUCTIVE ORGANS

HM–6. Male pelvis laterally prepared; bladder and exterior genitals can be opened.
Price $19.00

HL–11. Female pelvis laterally prepared; uterus, bladder and exterior genitals can be opened.
Price $19.00

H–247. Section through female pelvis. A very carefully prepared model, showing clearly and well the female reproductive organs. (See cut, page 16.)
Price $20.00



HL–12

HL–12. Seven models showing the period of gestation, after natural preparations—(See cut, page 17.)

1. An embryo about six days old, considerably enlarged, on stand.
2. A uterus with embryo in the first month of gestation; the umbilical bladder is visible.
3. A uterus with embryo in the third month of gestation.
4. A uterus with foetus (backside position) in the fourth and fifth month.
5. A uterus with foetus (dorsal position) in the fifth month.
6. A uterus with foetus (normal position); placenta and umbilical cord are visible.
7. Half of the pelvis with pregnant uterus in the ninth month; the child can be taken out in order to show the placenta with its blood vessels.

Not carried in stock.

Duty free price $75.00

HL–19. Female pelvis and lumbar region, modeled after natural preparations at the Anatomical Institute of the University of Jena. The model is sagitally cut through, and therefore can be disarticulated into two halves, so that each half alone is a complete subject of instruction. At the left half, the pelvic intestines are provided with the covering of the peritoneum, and on its outside, the superficial fascia of the body with the crural duct and the inosculation of the Vena saphena magna are to be seen. At the right half the peritoneum is removed, so that the bladder, the uterus with the ovary and the uterine tube, as well as the course of the urinal duct from the kidneys to the bladder, are laid bare. The ramifications of the lumbar and the sacral nerves are also represented. Not carried in stock.

Duty free price $80.00

HK–45. Obstetric phantom, a bone preparation, after Prof. Dr. Sellheim. It consists of a flexible connection between an osseous child's skull and the female pelvis, which allows an excellent demonstration of all the phases of parturition. According to the rules of art, and under the continual and perfect control through the eye, the obstetrical forceps can be applied in any suitable situation, and the corresponding operation finished. Apart from its various kinds of applicability, the phantom offers the great advantage, compared to the ordinary operation phantoms, that one does not run any risk of coming in contact with anything infectious, as may be the case if operating with a child's corpse, though the situation is quite natural here.

Price $90.00

ARTICULATIONS

H–239. Foot and Ankle.

H–233. Articulation and ligaments of the Hip Joint, on slab.
Price $4.50

H–234. Articulation and ligaments of the Knee Joint, on slab.
Price $4.50

H–235. Articulation and ligaments of the elbow joint (extended), on slab.
Price $3.00

H–236. Articulation and ligaments of the elbow joint (flexed), on slab.
Price $3.00

H–237. Articulation and ligaments of the hand and wrist, on slab.
Price $4.00

H–238. Articulation and ligaments of the shoulder, on slab.
Price $3.50

H–239. Articulation and ligaments of the foot and ankle, on slab. (See cut).
Price $4.50

B. MODELS OF THE CHORDATA

For over fifty years we have been making models and casts of plaster and composition, so that our experts have developed a very exceptional technique, guaranteeing that the finished model will be as good as can be produced. Our aim has always been to give as fine a piece of work as can be obtained, at the lowest price possible without sacrificing the quality of the model. Most of the models listed here are made by us, but we also include a few European models which we have found exceptionally well executed, and which can be imported duty free for educational institutions at a lower price than would be possible if of American production.

MA–1. Model of Rabbit.

SUB-PHYLUM EUCHORDA

Class Mammalia

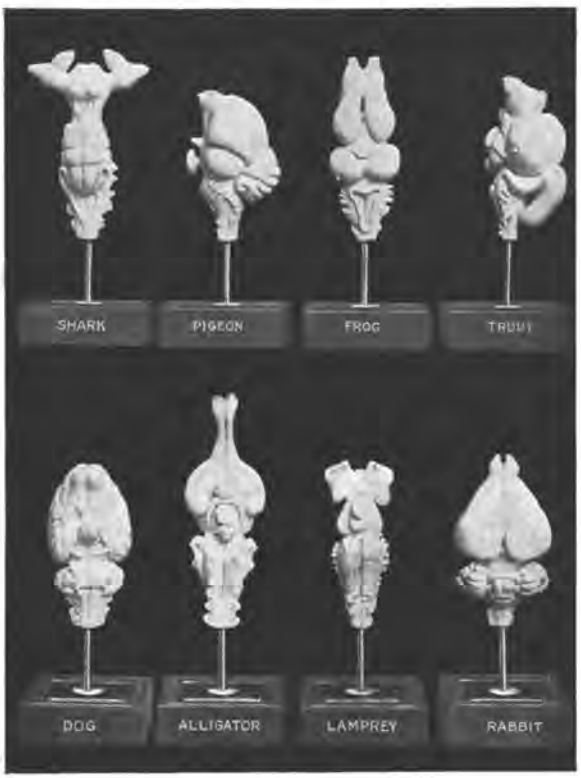
MA–1. Model of the dissection of a rabbit, mounted on ebonized panel, 18 by 26 inches. The rabbit was chosen as a good type for study. This is a very accurate model, with full descriptive label.

Price $30.00

MA–2. A series of casts of the skulls of the anthropoid apes, natural size; accurate casts from natural skulls. Of very great interest in connection with the study of the evolution of man.

	Price
a. Male gibbon	$4.00
b. Male orang-outang	6.00
c. Male chimpanzee	6.00
d. Male gorilla	8.00
Set of four models as above	$22.50

N.B.—We can also supply casts of the crania of prehistoric man. See page 173.



MA–3

MA–3. Models of brains of typical vertebrates, of uniform size, approximately 6½ inches in length, mounted on nickel-plated standards. The models are of the dog, rabbit, pigeon, alligator, frog, trout, shark and lamprey.

Price, each $6.00
Series of eight for $40.00

MA–4. The American Museum series of six models illustrating the evolution of the fore foot of the horse, from the four-toed foot of the Eocene horse to the horse of today. (See cut, page 161.)

Price $25.00

MA–5. The American Museum series of six models as above of the hind foot.

Price $25.00

MA–6. The series of six models prepared by Dr. Richard S. Lull of Yale University, to illustrate the evolution of the elephant's head. (See cut, page 167.)

Price $60.00

AA–1. Chicken.

Class Aves

AA–1. Model of a dissection of a chicken, mounted on ebonized panel, 21 by 29 inches, with a full descriptive label attached. A large model showing clearly the complete anatomy of the hen.

Price $18.00

AA–2. Models of the development of the chick. 17 models in wax, mounted in a glass-covered box.

1. Genital organs of chicken, with development of egg.

2. Median section of egg.

3–11. Stages of incubation from second to 21st day.

12–13. 13th and 17th day. Chick removed from egg and showing development of the organs.

14. 17 day egg showing circulatory system in the allantoid.

15–16. Enlarged embryo, 50 hours and seven days, showing the connection between amnion, allantoid and sac.

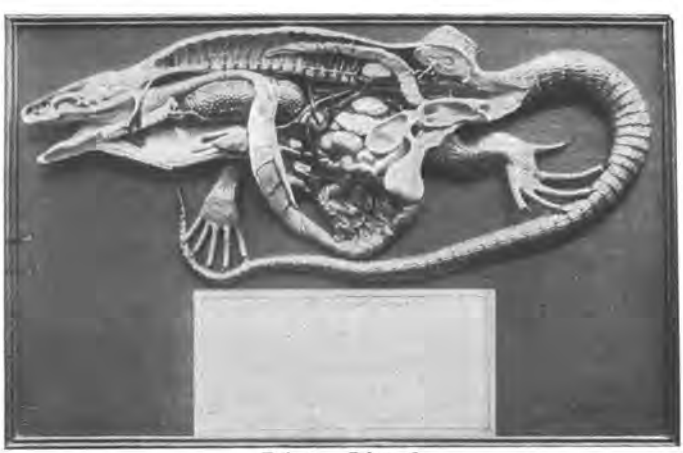
17. Chick emerging from shell.

Price (for duty free importation) $50.00

Class Reptilia

RA–1. Model of the dissection of the lizard, mounted on ebonized panel, 18½ by 27½ inches, with full descriptive label attached. This model shows clearly the entire anatomy of a typical reptile.

Price $22.50



RA–1. Lizard.

RA–2. Model of the head of a poisonous snake (Vipera aspis), showing clearly the poison apparatus. Size of model, 9 x 8 inches. Mounted on ebonized base, with separate descriptive key.

Price $15.00

Class Amphibia

BA–1

BA–1. Dissection of frog, greatly enlarged, mounted on ebonized panel 26 by 16 inches, with full descriptive label attached.

Price $18.00

BA–2. Development of the frog (Rana esculenta). 24 wax models in a glass case as follows:

1. The genital organs of the frog.
2. An egg with its gelatinous envelope.
3–8. The egg separated from the gelatinous envelope, showing segmentation.
9. A section of the egg at the end of the segmentation stage.
10–13. Embryos at different stages of development.
14. A section of an embryo.
15. A tadpole just emerging.
16–17. Tadpoles with external gills.
18. Tadpole with external gills atrophied.
19. A tadpole opened to show internal anatomy.
20–23. Tadpoles and frogs of different ages up to the adult stage.
24. An adult frog opened to show internal anatomy.

Price of the complete set (for duty free importation) $50.00

BA–3. Reduced collection containing eggs at different stages of development, the tadpole emerging, with external gills, with gills atrophied, with spiracle, with hind feet, with four feet, with stub tail. Ten models in all.

Price (for duty free importation) $30.00

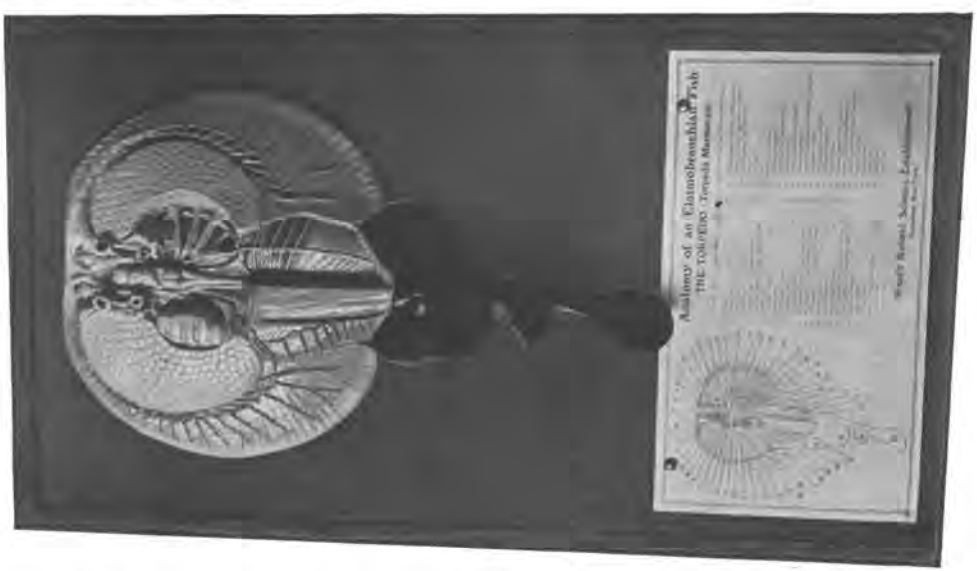
BA–4. Dissection of Proteus anguineus, enlarged, mounted on ebonized panel, 27½ by 18½ inches, with full descriptive label attached.

Price $22.50

Class Pisces

PA–1. Anatomy of the perch, enlarged model showing complete dissection of perch, mounted on ebonized panel 17 by 22 inches, with full descriptive label attached.

Price $15.00



PA–2

PA–2. Anatomy of Torpedo fish, enlarged model showing dissection from dorsal side, so that the electric organs are clearly shown, mounted on ebonized panel 14 by 24 inches, with full descriptive label attached.

Price $15.00

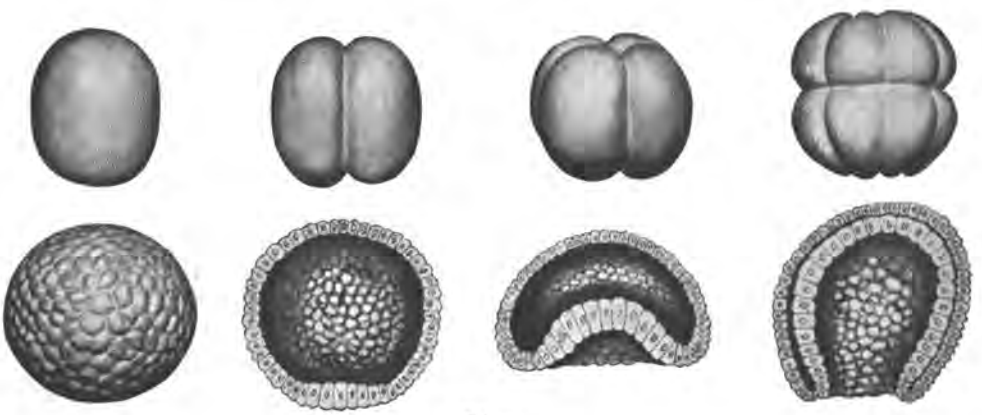
PA–3. Development of the trout (Salmo fario). Twenty wax models, enlarged about twenty diameters, in glass-covered box, 69 by 88 cm. The series contains egg before dehiscence of follicle, five stages of segmentation, first appearance of embryo, six developments of embryo, the embryo just before hatching, six microscopic sections of germ, embryo, etc.

Price (for duty free importation) $60.00

SUB-PHYLUM CEPHALOCHORDA

CA–1. Model of Amphioxus dissection, greatly enlarged, mounted on ebonized panel 22 by 12 inches, with full descriptive label attached.

Price $12.00



CA–2

CA–2. Development of the egg of Amphioxus. Eight models as follows—

a. Fertilized egg.
b. Two cell stage.
c. Four cell stage.
d. 16 cell stage.
e. Blastula.
f. Blastula, T. S.
g. Formation of gastrula.
h. Gastrula.

Price of the eight models $40.00

SUB-PHYLUM UROCHORDATA

UA–1. Greatly enlarged model of Molgula dissection, showing the complete anatomy. The model consists of two sections, one showing the structure with ligaments, the internal organs being removed; the other shows the organs, the mantle and gills being removed. Both sections are mounted on an ebonized panel 17 by 20 inches, with a full descriptive label attached.

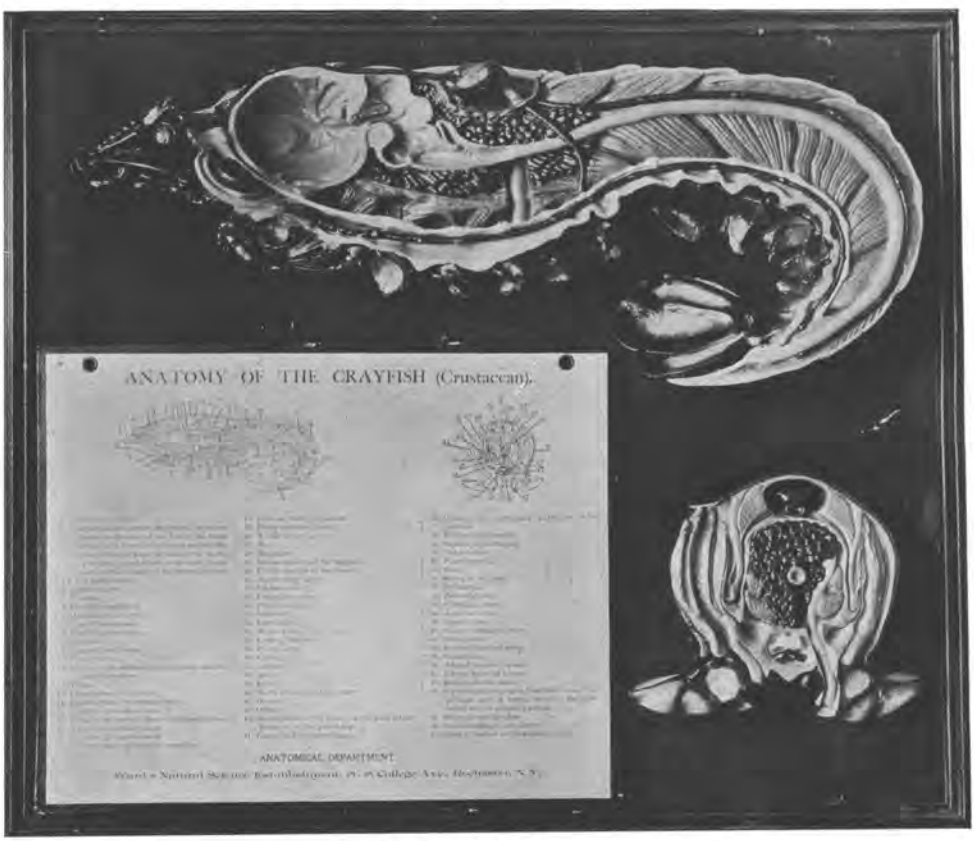
Price $18.00

C. MODELS OF INVERTEBRATA

The part that models play in teaching biology has steadily increased until now at last no arguments are required. As in the case of the higher phylum, our models are of large size so that all details are clearly shown, and are for the most part mounted on ebonized wooden panels *with their labels permanently attached.* This adds slightly to the cost as larger panels are required, but the teacher never finds himself without the key, and never has to trust entirely to his memory.

The models are made here, first cast, and then carefully painted by trained artists, whose knowledge of anatomy prevents mistakes. We guarantee all of the models sold by us to give satisfaction.

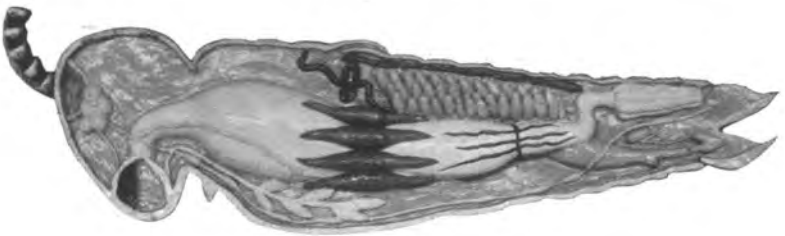
PHYLUM; ARTHROPODA



IA–1. Crayfish.

IA–1. Model of Crayfish greatly enlarged—2 sections mounted on ebonized panel 17 x 20 inches with full descriptive label attached. One section opened longitudinally is a complete dissection while the second is a cross section of the cephalothorax through the heart.

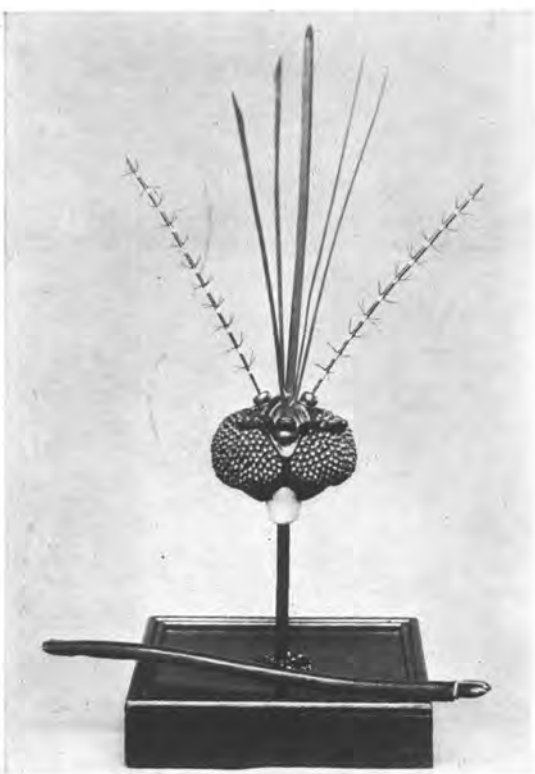
Price $15.00



IA–2

IA–2. Model of dissection of a grasshopper, the original was prepared here in our laboratories by our Mr. Blackstone. It measures 17½ x 6 inches and is mounted on ebonized panel 20 x 9 inches with full descriptive label.

Price $17.50



IA–3

IA–3. Model of head of House Mosquito, Culex pipiens, female, can be taken apart, the model is 15 inches high.

Price $20.00

The following are the most desirable of the European Insect models and as they can be imported free of duty for Educational Institutions, they are not carried in stock but will be ordered when desired. About two months is required for delivery.

IAS–4

Order Coleoptera

IAS–4. Melolontha vulgaris, dissectable model, 45 times enlarged, legs, wings, etc. detachable, intestines can be taken out.
Duty free price $50.00

IAD–5. Head of Cicindela, dissects into eleven parts, mandible jaw, lower lip, labrum, palp, etc. 14 cm high and 45 cm long on standard.
Duty free price $45.00

IAS–6. Head and Mouth parts of Scarabus, greatly enlarged, one lower jaw with maxillary palp as well as the underlip with the two lip palps can be separated showing the interior of the mouth.
Duty free price $12.00

Order Lepidoptera

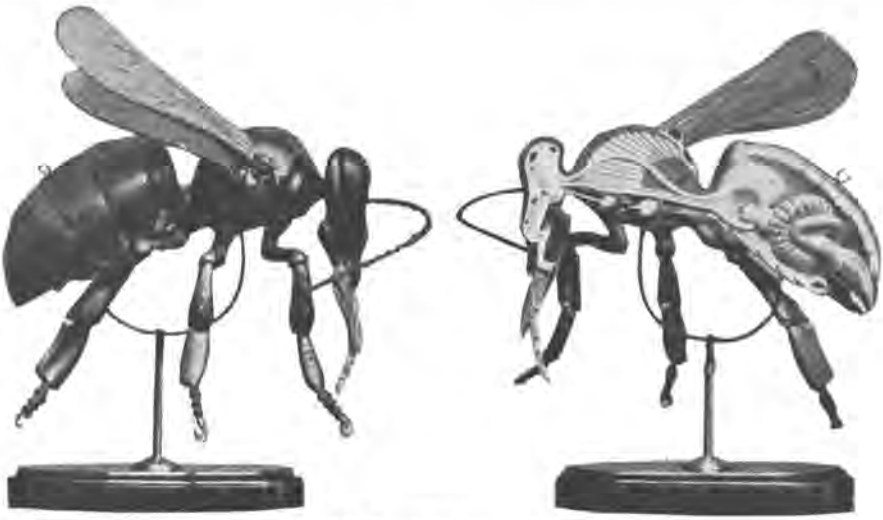
IAD–7. Anatomy of Silkworm, Sericaria mori, 2 models on base, showing external and internal anatomy. On the first is shown the head, antennae, stigmata, etc., on the other the digestive system, trachea, nervous system, etc. Mounted on base 18 inches long with label.
Duty free price $25.00

Order Hymenoptera

IAS–8. Model of worker bee, Apis mellifica, 45 times enlarged, one side shows exterior and other interior structure, intestines are removable. (See cut, page 28.)
Duty free price $35.00

IAS–9. Head and Mouth parts of worker bee, greatly enlarged, dissecting.
Duty free price $15.00

IAS–10. Nervous system of bee, schematic, on board.
Price $2.00



IAS–8. (See page 27.)

IAB–11. Honey bee, 5 models as follows:

a. Comb with queen cells, worker, drone & brood cells, covered and uncovered cells; eggs, larvae and pupae, also honey cells and bee bread cells. Eggs and larvae are shown in different stages of development. In the queen cell and drone cell the brood is visible.

Duty free price $90.00

b. Drone X 10, not dissecting.

Duty free price $20.00

c. Worker X 10, Proboscis, legs & wings removable.

Price $25.00

d. Queen bee X 10, not dissecting.

Duty free price $20.00

Series complete (duty free price) $150.00

Order Diptera

IAB–12. House fly, Musca domestica 30 X enlarged, all parts are clearly shown, legs & wings removable, stretching of proboscis illustrated by mechanism.

Duty free price $40.00

IAD–13. Head of Malarial Mosquito (Anopheles maculipennis, female) same size and arrangement as IA–3.

Price $25.00

IAD–14. Yellow fever mosquito (Stegomya fasciata, female) complete model of exterior, 18 inches long on base.

Duty free price $40.00

IAD–15. Tse Tse fly (Glossina palpalis) the carrier of the sleeping sickness.

a. Female fly, 25 inches long, gorged with blood showing external morphology.

Duty free price $95.00

b. Larva just hatched, 6 inches, on pedestal.

Duty free price $10.00

c. Pupa, 5½ inches, on pedestal.

Duty free price $10.00

d. Transverse section of body, showing the parasitic trypanosomes.

Duty free price $60.00

e. Trypanosoma gambiensis, the protozoa parasite transparent model 9 inches long in case.

Duty free price $40.00

Complete series of five models (duty free price) $200.00

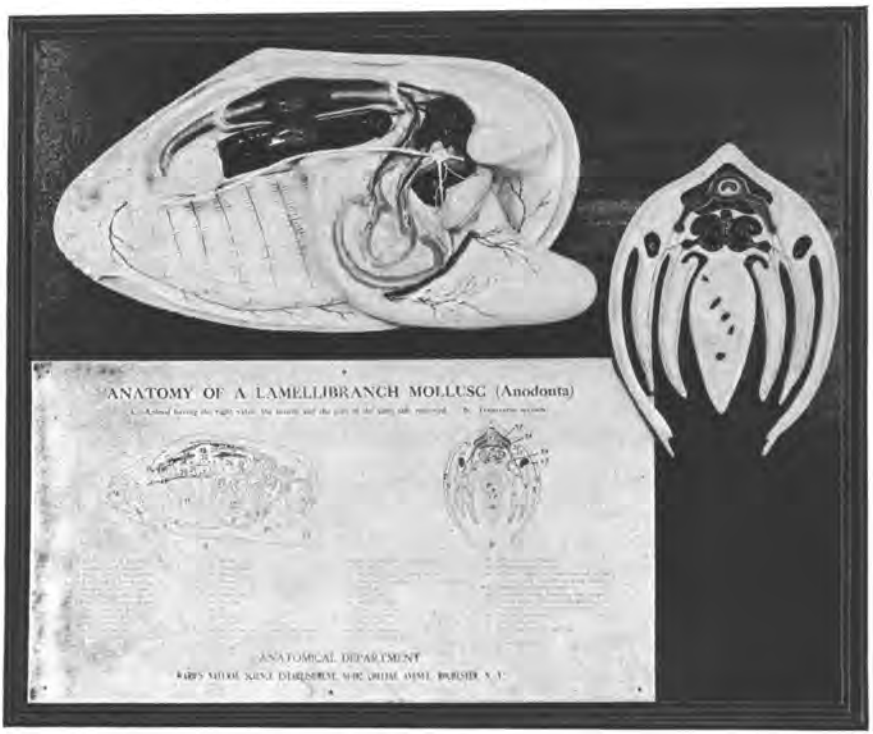
Order Anopleura

IAB–16. The head louse, Pediculus capitis, female, enlarged about 70 times, external morphology only, on pedestal.
Duty free price $25.00

IAD–17. Egg of head louse on hair, enlarged model, transparent 8 inches long.
Duty free price $12.00

PHYLUM; MOLLUSCA

IA–18. Model of Clam (Anodonta cygnea) two greatly enlarged sections mounted on ebonized panel 17″ x 20″ with full descriptive label attached; one shows a dissection from the side and the second a cross section in the middle region showing the relative position of mantle, gills, tubes, etc.
Price $15.00



IA–18. Clam.

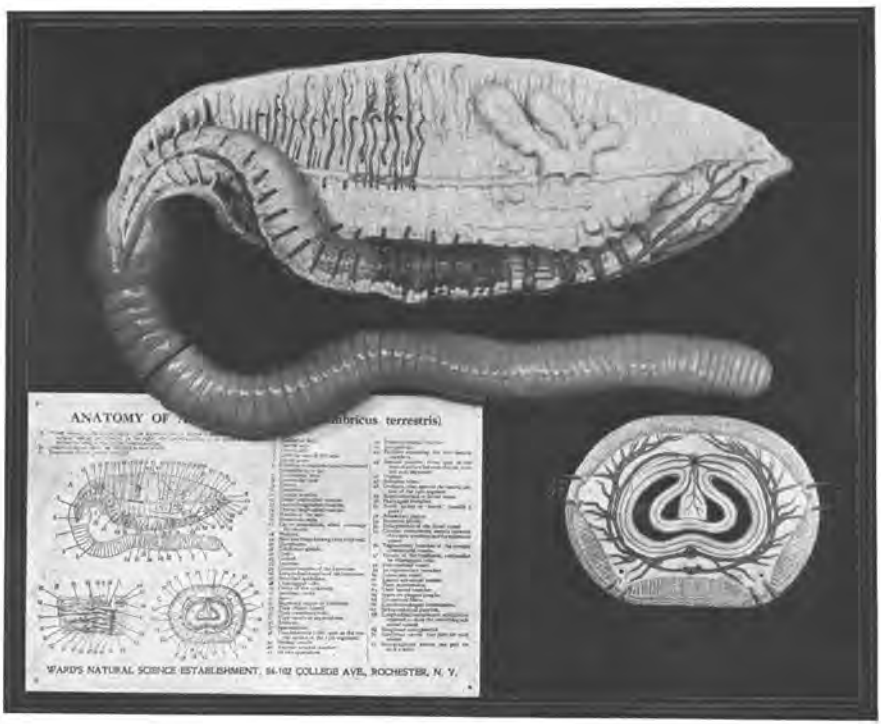
IA–19. Model of Gastropod (Helix pomatia) enlarged 12 diameters. The shell has been removed and one sees the digestive apparatus, the blood, the reproductive and the nervous systems in detail; on 43″ x 14″ ebonized panel with label. Not carried in stock.
Duty free price $80.00

IA–20. Model of Cephalopod (Sepia officinalis)—two models showing dissections from a vertical side, one superficial, the other deeper, all details are shown on ebonized panel with label. Not carried in stock.
Duty free price $30.00

PHYLUM; BRYOZOA

IA–21. Enlarged model of Plumatella mounted on ebonized panel 15½″ x 21½″ with full descriptive label attached. Shows terminal branch with animal extended, a cut shows the inner anatomy in detail.
Price $17.50

PHYLUM; ANNELIDA



IA–22

IA–22. Enlarged model of Earthworm on ebonized panel 20″ x 24″ with full descriptive label attached. Two models, one of the worm cut longitudinally and turned back to show a perfect dissection, the second a cross section.

Price $18.00

IA–23. Marine Worm (Arenicola) enlarged model on ebonized panel 22″ x 17″ with full descriptive label attached. Dissection on lateral side showing complete anatomy. (See cut, page 31.)

Price $18.00

IA–24. Leech (Hirudo officinalis) enlarged model on ebonized panel 24″ x 20″ with full descriptive label attached. Two models showing the entire anatomy in great detail.

Price $18.00

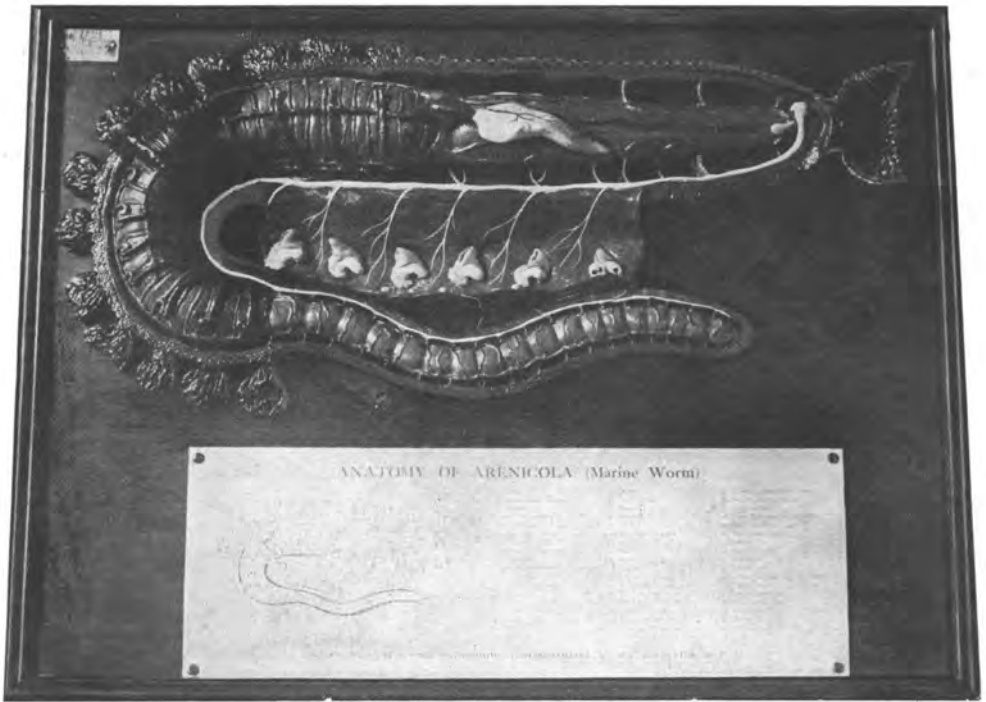
PHYLUM; PLATYHELMINTHES

IA–25. Liverfluke (Distomum) enlarged model on ebonized panel 22″ x 17″ with full descriptive label attached. Two models, one showing dissection from dorsal side, the second showing dissection from ventral side.

Price $15.00

IA–26. Taenia solium (Tape worm) enlarged model on ebonized panel 20″ x 17″ with full descriptive label attached. Two models, one showing scolex and the other a dissection of a ripe proglottid.

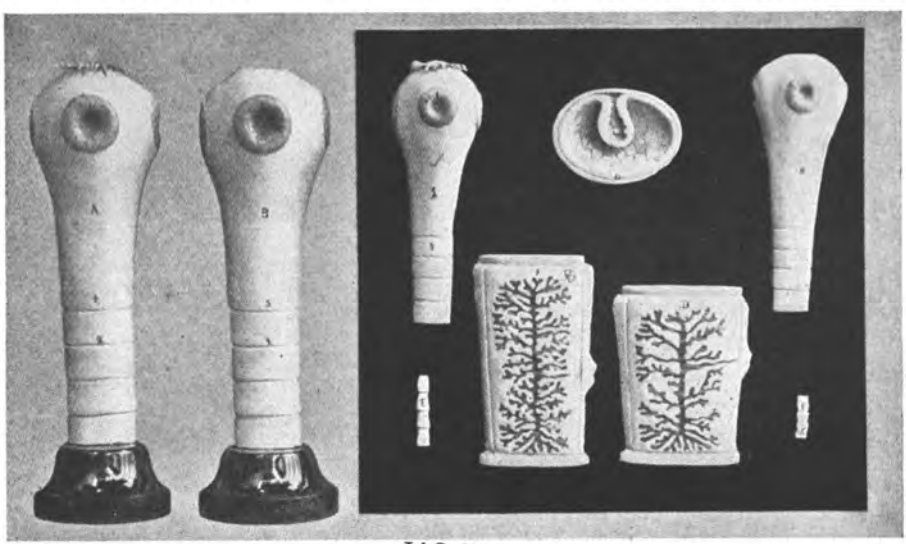
Price $12.00



IA–23. Marine Worm. (See page 30.)

IAS–27. Models of Taenia solium and Taenia mediocanellata for comparison, see cut.

a. Taenia solium, armed tapeworm ..... $ 6.00
b. Taenia mediocanellata, unarmed tapeworm 6.00
c. Heads & segments mounted on board 10.00



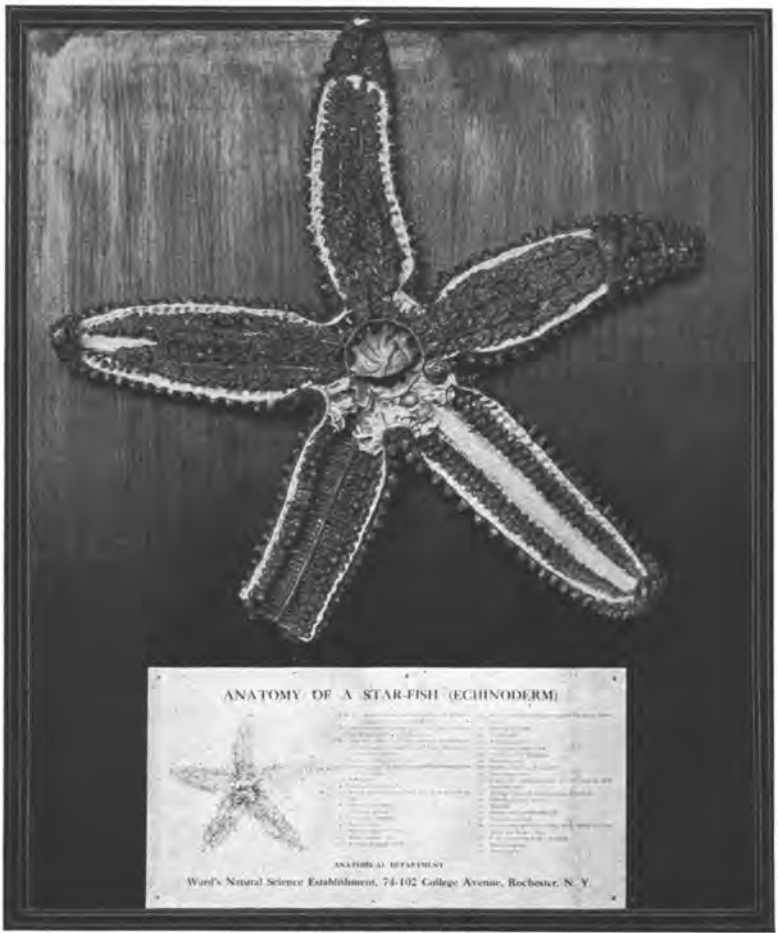
IAS–27

a b c

PHYLUM; ECHINODERMATA

IA–28. Enlarged model of Starfish mounted on ebonized panel 20″ x 24″ with full descriptive label attached. The upper surface is dissected and the arms are cut to different levels to show structures.

Price $15.00



IA–28. Starfish.

IA–24. Evolution series of the Starfish (Asteracanthion) 18 models in glass covered case. The series includes various stages of the egg and larvae, Blastula, Gastrula, Tornaria, Scyphistoma, Branchina, Brachiolaria, Echinoderm from the loss of larval appendages to the formation of the ambulacral tentaculae. Not carried in stock.

Duty free price $165.00

PHYLUM COELENTERATA

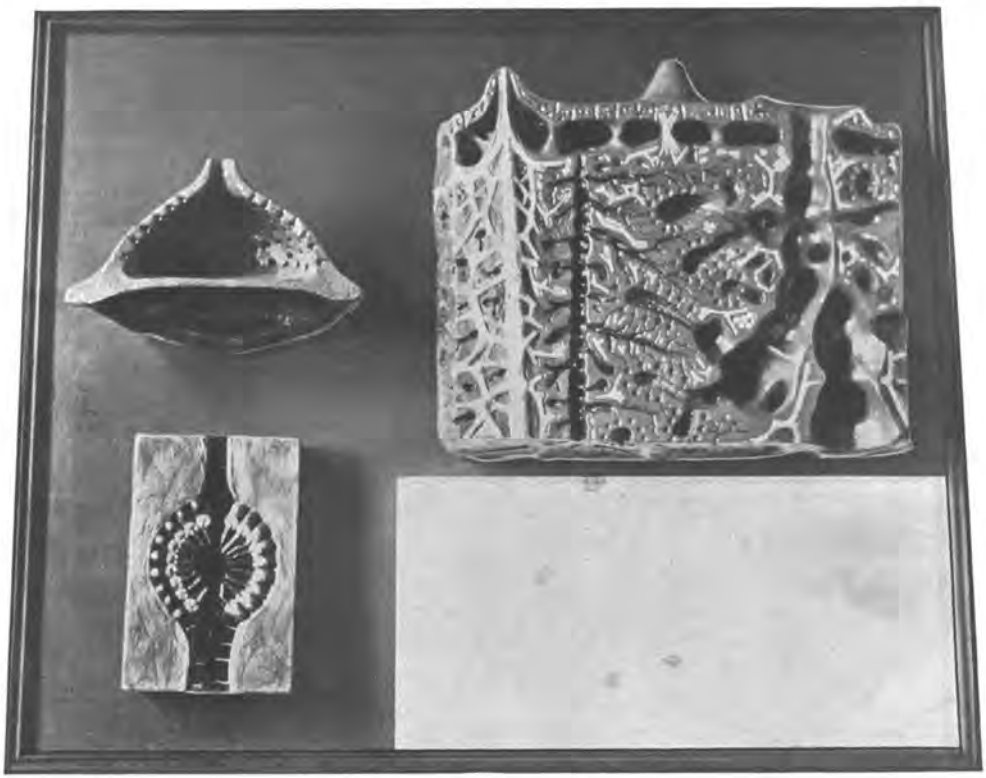
IA–30. Enlarged model of Medusa (Aurelia) on ebonized panel 15½″ x 21½″ with full descriptive label attached, 2 models.

Price $15.00

IA–31. Enlarged model of Corallium rubrum on ebonized panel 15″ x 16½″ with full descriptive label attached. Shows a piece of coral with two corallites, one in section showing anatomy.

Price $18.00

PHYLUM; PORIFERA



IA–32. Horny Sponge.

IA–32. Enlarged model of Horny Sponge (Euspongia) mounted on ebonized panel 20″ x 24″ with full descriptive label attached. Three sections, see cut.
Price $20.00

IA–33. Enlarged model of Grantia. Two models in plaster with label.
Price $7.50

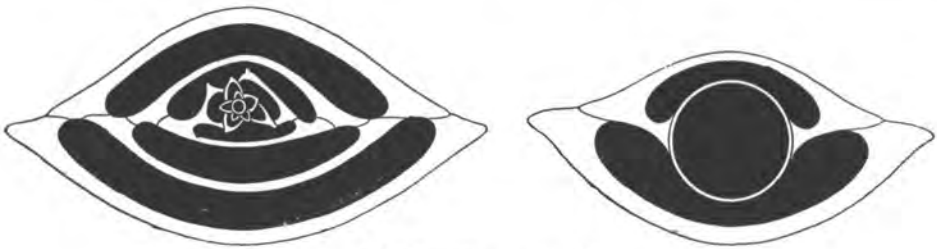
PHYLUM; PROTOZOA

IA–34. A set of ten models of Rhizopods as follows: Amoeba, Arcella, Cochliopodium, Difflugia, Diplophrys, Euglypha, Hyalosphenia, Nebela, Pamphagus, Trinema.
Single models $3.00. Set $25.00

IA–35. A set of twenty models of Foraminifera, list upon request.
Price $20.00

IA–36. Biloculina depressa, d'Orb. (See cut, page 34.) A Foraminifera now living in the Atlantic Ocean. Enlarged 270 times. Size of model 1¼ inches.
Price $7.50

IA–37. Triloculina trigonula, d'Orb. A Foraminifera from the Eocene of the Paris Basin, enlarged 95 and 320 times. Size of larger model 2¼ inches.
Price per set $5.00

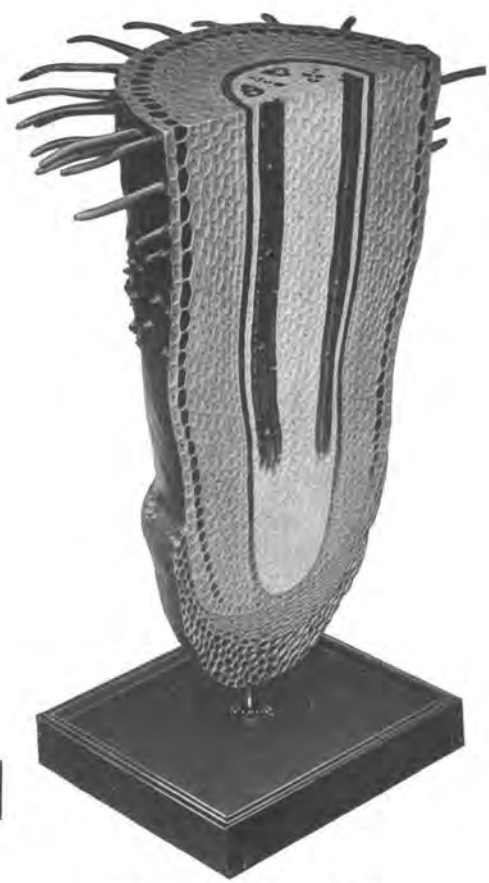


IA-36. (See page 33.)

D. BOTANICAL MODELS

We have restricted our listing of botanical models to a few general models that should be in every school. Through our connections in Europe we can import any of the others for those interested. Those listed here are all made by us, and so delivery can be made promptly.

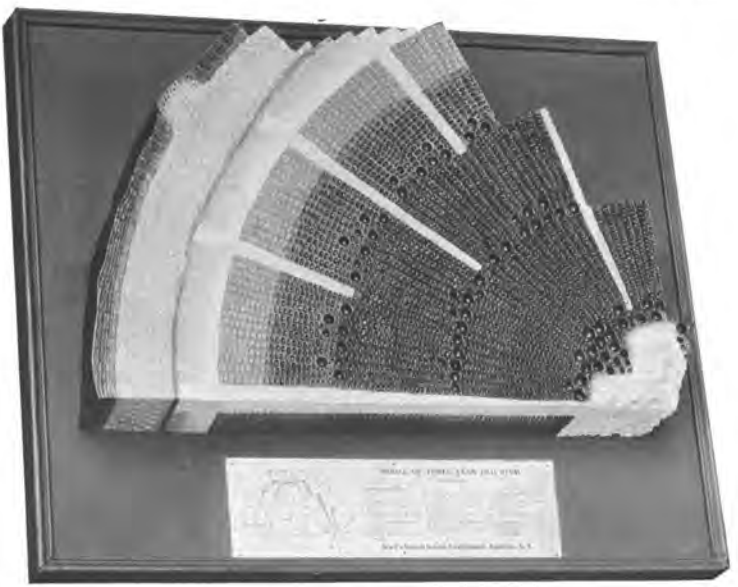
BA-1. Model of Leaf.



BA-2. Model of Root.

BA–1. Model of leaf, size 25 x 21 inches on stand. Cell structure of the typical leaf is well shown by sections of petiole and leaf while the external venation is also seen carefully painted.

Price $17.00



BA–3. Model of Stem.

BA–2. Model of young root, shows longitudinal and cross section as well as external structure. A large model 24 inches high on pedestal, carefully painted.

Price $20.00

BA–3. Model of 3 year old, stem of a dicotyle 24″ x 16″ carefully painted to show all structures and mounted on ebonized panel with full descriptive label attached.

Price $22.50

BA–3a. Same as model BA–3 but without ebonized wooden base.

Price $17.50

BA–4. Model of stem of Monocotyle.

Price $17.50

BA–5. Model of regular ideal flower, dissectable into calix, sepals, petals, ovary, pistil and stamens, 11″ in diameter, 8″ high on standard.

Price $20.00

N.B. There is a very large series of botanical models made by the German dealer, Brendel, which can be imported free of duty for Educational Institutions. These we are at all times glad to import at the dealer's price F.O.B. shipping point. If interested, we are glad to send list with prices.

BA–5

SECTION II. CHARTS

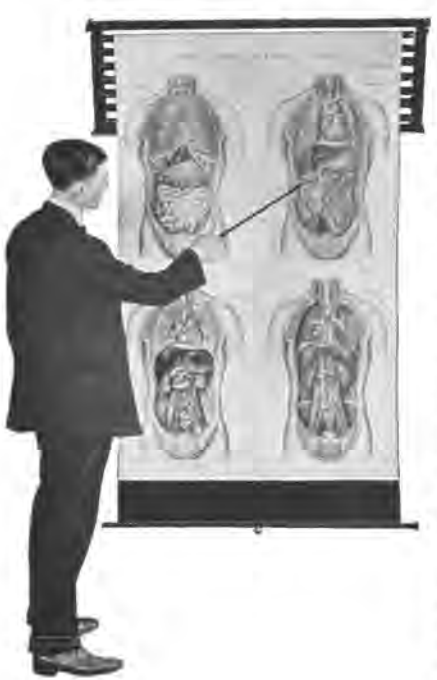
The charts listed are those that have proved their value, and need no further introduction.

We can merely suggest that they will meet the most technical requirements of medical teaching, and will be found unequalled for the less exacting instruction in anatomy for nurses, laboratory and x-ray technicians, physical education classes, physiology and human anatomy courses in colleges, normal schools, high schools, Y. M. C. A. and Y. W. C. A. courses in physical training, personal and sex hygiene, etc.

American Frohse Life Size Anatomical Charts

Edited, Revised and Augmented by Max Brodel. 8 Charts. Size 42x64 Inches—Comprising Thirty-five Life Size or Larger Illustrations

Chart No.	
FA 1	The Skeletal System.
FA 2	The Muscular System.
FA 3	The Peripheral Nervous System, The Arteries and Veins.
FA 4	Schema of the Circulation. The Heart. The Skin (microscopic sections).
FA 5	The Ear. The Eye.
FA 6	The Thoracic and Abdominal Viscera.
FA 7	The Head and Neck.
FA10	10a—The Male Pelvis and Perineum. 10b—The Female Pelvis and Perineum.



The charts represent a noteworthy achievement in the field of anatomical illustration, and no classroom where anatomy or physiology is a part of the instruction can afford to be without them.

Anatomy and Physiology — The Frohse Charts, being true to life in size and artistic delineation, are all of great value in teaching anatomy (human and comparative), and physiology. The outstanding features of these charts are too numerous to be described in this short paragraph, but attention is called to Plate No. 6. The four charts of this plate represent a complete dissection of the thoracic abdominal organs, nerves, and blood vessels. With the aid of these figures the necessary fundamentals of anatomy can be more easily taught as a basis for the study of physiology. Chart 6a shows the great vessels of the neck, the thymus and thyroid glands, the lungs, heart, diaphragm, liver, stomach and intestines, just as they appear in the living body. Charts 6b, c and d, show more deeply situated structures and more intimate relations. Note the clear illustration of the external and internal structure of the heart and lungs in Charts 6b and 6c, also the pulmonary circulation, the aortic arch and great vessels, and the nerves to the heart and the stomach. Note the excellent illustration of the kidneys, spleen, suprarenal glands, the pancreas and the duodenum, and the abdominal vessels and nerves.

Prices for Frohse Anatomical Charts

SINGLE PLATES	PLAIN MOULDINGS TOP AND BOTTOM		SPRING ROLLER BOARD DUST-PROOF COVER		STEEL SPRING ROLLER CASE	
	HAND MTD.	MACH. MTD.	HAND MTD.	MACH. MTD.	HAND MTD.	MACH. MTD.
Any plate	8.10	5.40	10.80	8.10	11.70	9.00

SET OF PLATES	NYCO UTILITY CASE	
	HAND MTD.	MACH. MTD.
Complete set of 8	$81.00	$61.00
Any 7 plates	72.00	54.00
Any 6 plates	63.00	46.80
Any 5 plates	53.55	40.05
Any 4 plates	44.10	33.30

W. & A. K. Johnston's Physiology Charts

Simplified for Elementary Instruction

Size 30x40 inches

1. The Skeleton and Structure of Bone.
2. The Joints and Ligaments, and the Structure of the Ligaments and Cartilage.
3. The Muscular System and the Structure of Muscles.
4. The Heart, Arterial Blood Vessels, Capillary Blood Vessels, etc.
5. Veins, Organs of Respiration, Circulatory System.
6. Lymphatics and Organs of Digestion.
7. The Brain, Nervous System and the Structure of the Skin.
8. Organs of Sense and Voice.
9. Showing Effects of Alcohol on the Body.
10. Showing Effects of Tobacco on the Body.
11. Showing Cause of Typhoid Fever.
12. Showing Cause of Malaria and Ague. Nos. 11 and 12 show also the Cause and Course of Consumption.

Johnston's Physiology Charts have been specifically recommended by many State boards of Education—and in all states, where Physiology charts are approved, they are universally accepted as complying with all requirements.

The importance of a knowledge of physiology justifies the widespread tendency towards its better teaching. These charts give excellent and life-like illustrative matter for class study.

A complete Manual, pointing out the teaching value of each chart and suggesting class room uses accompanies every set of charts.

Prices

	Rope Manila Taped Edges	Mounted on Cloth
Set of 8 in Solid Chart Head with tripod	$ 8.50	$14.75
Set of 12 in Solid Chart Head with tripod	10.50	19.75

The first eight charts can also be had in a smaller size, 22 in. by 28 in. Known as

JUNIOR SERIES SIZE 22x28 INCHES

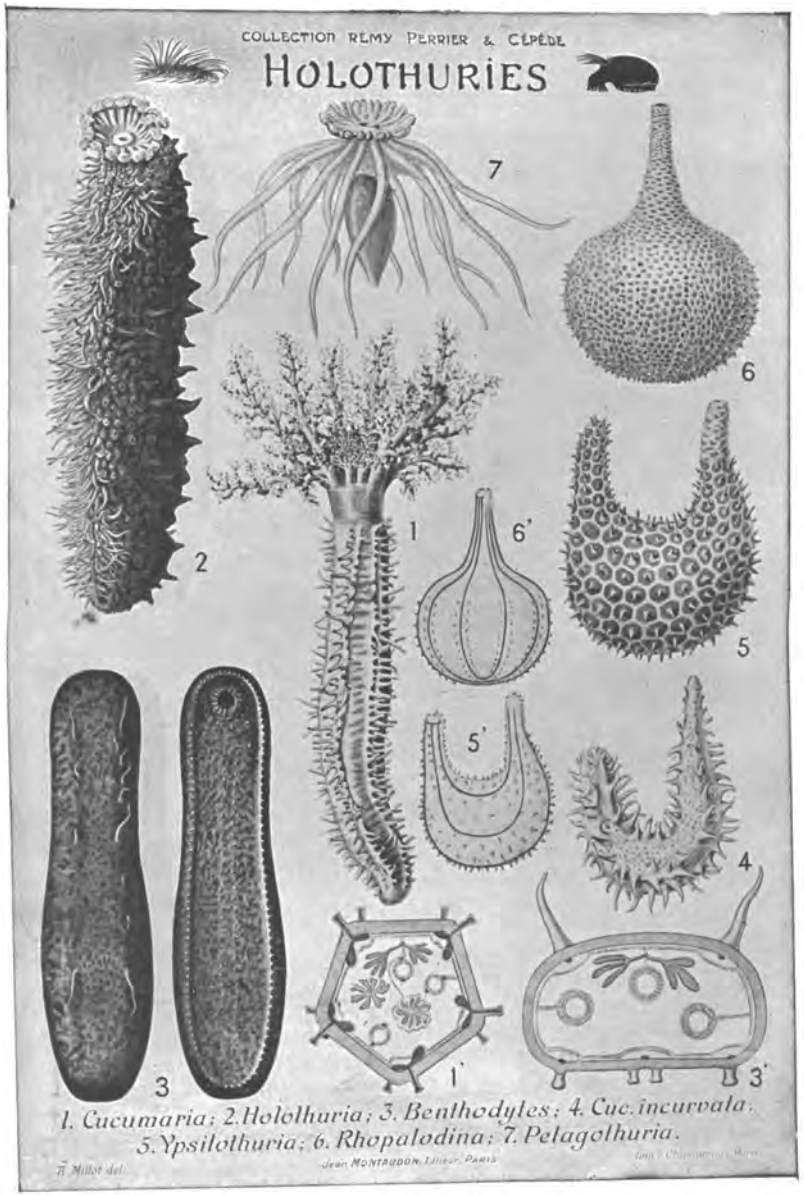
Same as the first eight except in size

Set of 8 durably cloth-backed, with tripod, $10.50
Set of 8 coated manila, edges taped, with tripod 6.50

Zoological Wall Charts

Prepared by Prof. Remy Perrier and Prof. Casimir Cépéde of the University of Paris

Published by Auzoux-Montaudon



E–6. Holothurians.

The Perriere-Cépède Zoological Wall Charts

The House of Auzoux, known all over the world for their excellent scientific works, some years ago started to put on the market a series of charts known as the Perriere Cépède charts. These were prepared under the supervision of Prof. Remy Perriere and Prof. Casimir Cépède of the University of Paris. Due to the death of Monsieur Montaudon, for years the Director of the House of Auzoux, the series have never been completed, but a certain number are ready, which we offer to our customers. They are 42 by 62 inches, lithographed in colors.

LIST OF CHARTS NOW READY

A-2 Maturation of sexual elements
A-3 Fecundation
A-4 Mimicry (Orthoptera)
B-2 Evolutionary cycle of the Foraminifera
B-4 Flagellate parasites—Trypanosomes and Tsetse fly
B-7 Conjugation of the Infusoria
B-8 Haemosporidea—Plasmodium
B-9 Evolutionary cycle of a Polycystid Gregarine
E-6 Holothurians
G-3 Excretory apparatus of the Annelids
H-9 Bothriocephalus
J-2 External morphology of crayfish
J-5 Free Copepods
J-6 Parasitic Copepods
K-6 Semi-metamorphosis of insects—Grasshopper
K-7 Last stage of the grasshopper (Schistocerca)
K-13 Diptera—the mosquitos
K-14 Diptera—the flies
N-1 Brachial openings of air-breathing vertebrates and development of the aortic system
P-1 Cyclostomes
Q-1 Anatomy of the frog
S-1 Birds—Skeleton and details
T-2 Mammals—Evolution of the visceral skeleton
T-12 Teeth of Carnivora
T-13 The Rodents—Anatomy of the squirrel and comparison of teeth of rodents
T-21 Spinal cord and meninges
T-22 The eye and the retina
T-23 Elements of nervous tissue

Price mounted on cloth with rollers, each $5.50

Jung, Koch and Quentell Zoology Charts

QZ–2. Sheep.

QZ–10. Common Spider.

35 Charts. Size 40x30 Inches. Hand Mounted on Durable Muslin
2 Charts. Size 40x60 Inches. Hand Mounted on Durable Muslin

A solid black, no-glare background, unusual contrast in the natural colors, and sharpness of details, all combine toward giving the "J-K-Q" charts splendid visibility at classroom distance. The increasing demand for these charts is due to the fact that they are proving to be a great help in making the study of Zoology more easily understood by the student. The instructor's work becomes much more effective.

CHARTS IN THIS SERIES

QZ–1. Domestic Cat.
QZ–2. Sheep.
QZ–3. Common Hare.
QZ–4. Chaffinch.
QZ–5. Sand Lizard.
QZ–6. Common Frog.
QZ–7. Freshwater Perch.
QZ–8. Roman Snail.
QZ–9. Cockchafer.
QZ–10. Common Garden Spider.
QZ–11. Domestic Goose.
QZ–12. (a) Common Adder, (b) Ringed Snake.
QZ–13. European Freshwater Tortoise.
QZ–14. Small Swan-Mussel (double chart).
QZ–15. Common Honey Bee.
QZ–16. Common White Butterfly (a) Egg, Caterpillar
QZ–17. Common White Butterfly (b) Chrysalis.
QZ–18. The Crayfish.
QZ–19. Earthworm (double chart).
QZ–20. Common Freshwater Polyp.
QZ–21. Crested Salamander.
QZ–22. Common Carp.
QZ–23. House-fly.
QZ–24. Mole-Cricket.
QZ–25. Microscopic Freshwater Crab, Cyclops.
QZ–26. Starfish.
QZ–27. Tapeworm.
QZ–28. Lithophyte.
QZ–29. Infusoria.
QZ–30. Animalculae or Protozoa.
QZ–31. Hedgehog.
QZ–32. Trichina.
QZ–33. Medicinal Leech.
QZ–34. Cuttlefish.
QZ–35. Dogfish.
QZ–36. Simple Ascidians.
QZ–37. Domestic Fowl.

PRICES SINGLE CHARTS			SETS OF CHARTS	No.36 FIXED CHART HEAD WITH TRIPOD	No.46 LOOSE LEAF CHART HOLDER AND TRIPOD	NO. 06 NYCO UTILITY CASE
No.50 WITH EYELETS	No.00 COMMON ROLLERS $4.45	NO. 5B "HANDI-FOLD" WITH EYELETS $5.20	Any 6 charts	$28.50	$33.40	$36.50
			Any 8 charts	36.00	41.20	47.00
			Any 10 charts	43.50	49.00	*49.50
			Any 12 charts	51.00	56.80	*58.50
			Any 16 charts	66.00	72.40	*76.50
$3.90 *$3.20 *Instead of being backed with muslin, charts are backed with Heavy Kraft Paper, edges Tape Bound.	No.02 SPRING ROLLER BOARD. DUST-PROOF COVER. $6.75	NO. 05 STEEL SPRING ROLLER CASE $7.50	Add or subtract for each chart added to or omitted from the above sets	3.75	3.90	*Mounted two on a roller.

N.B. Charts 14 and 19 are double size, and are priced:
with eyelets, $7.50; with common roller, $8.00; "handifold," $8.75; spring roller, $10.25

The Leuckart Charts

These have always been the standard charts for use in the colleges. Due to the fact that they can be imported duty free for educational institutions, we do not carry them in stock, but are always glad to import them to order. The series consists of 20 charts of the Chordata and 95 charts of the Invertebrata.

Price for individual single charts, mounted on cloth with rollers, $4.00
Price for individual double charts, mounted on cloth with rollers, 7.50
Price for single charts in lots of 20 or more, each 3.50
Price for double charts in lots of 20 or more, each 7.00

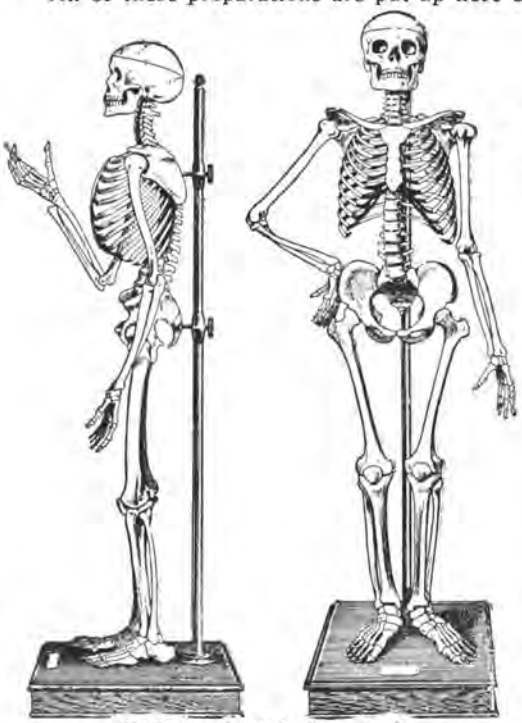
SECTION III. SKELETONS

A. Human Skeletons and Parts of Skeletons

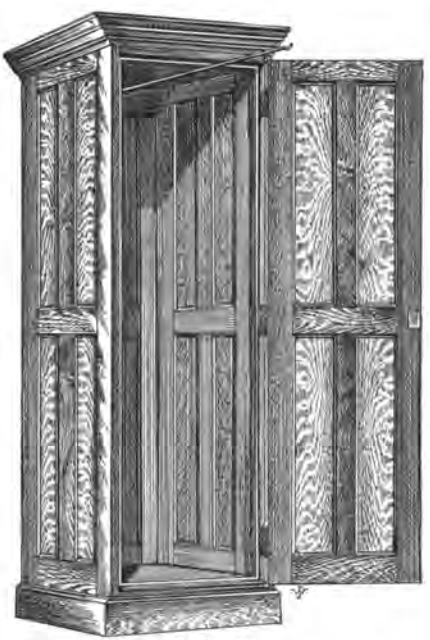
The proper method of mounting a human skeleton is a subject to which we have given a great deal of study, and we believe that our present method gives the very best result.

The vertebral column and ribs are permanently fastened together in their natural position. The arms and legs are not simply wired together, but are fastened in such a way that at each joint the same motion is allowed (and no other) as is possible in life. The limbs are fastened to the trunk by thumb screws, so that they can be easily separated for study. The skull is also removable by unscrewing a thumb nut, and the brain case is sectioned, while the lower jaw is held in place by two springs allowing the mouth to be opened or the jaw detached.

All of these preparations are put up here by our own skilled technicians.



Skeleton Clutch Standard



Cabinet

We furnish three methods of support—

(a) A cabinet fitted with special nickel-plated extension bracket that may be pulled out or pushed in at will.

(b) A clutch standard (see cut). We recommend this support, as it allows the detachment of the skull and limbs at will, while the body is still held firmly.

(c) A ring fastened to the skull. By this ring the skeleton may be hung on any bracket.

COMPLETE SKELETONS

HK–1. Adult skeleton, male or female, selected quality, with fine skull, mounted to hang from ring.

Price $125.00

HK–1a. Adult skeleton as above, with clutch standard and base.

Price $140.00

HK–1b. Adult skeleton as above, in hard wood cabinet, equipped with extension bracket.

Price $175.00

HK–2. Adult skeleton, male or female, good quality, with fine skull, mounted to hang from ring.
Price $105.00

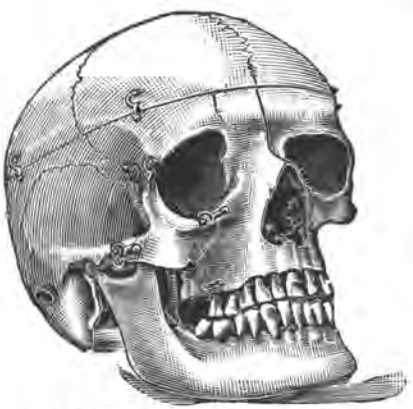
HK–2a. Adult skeleton as above, with clutch standard and base.
Price $125.00

HK–2b. Adult skeleton as above, in hard wood cabinet, equipped with extension bracket.
Price $155.00

HK–3. Adult skeleton, disarticulate (except skull), with the bones of one hand and one foot strung on cord. In pine box with compartments and label.
Price $55.00

HK–4. Foetal skeleton, mounted dry, with natural ligaments. Bones somewhat discolored.
Price $30.00

SKULLS



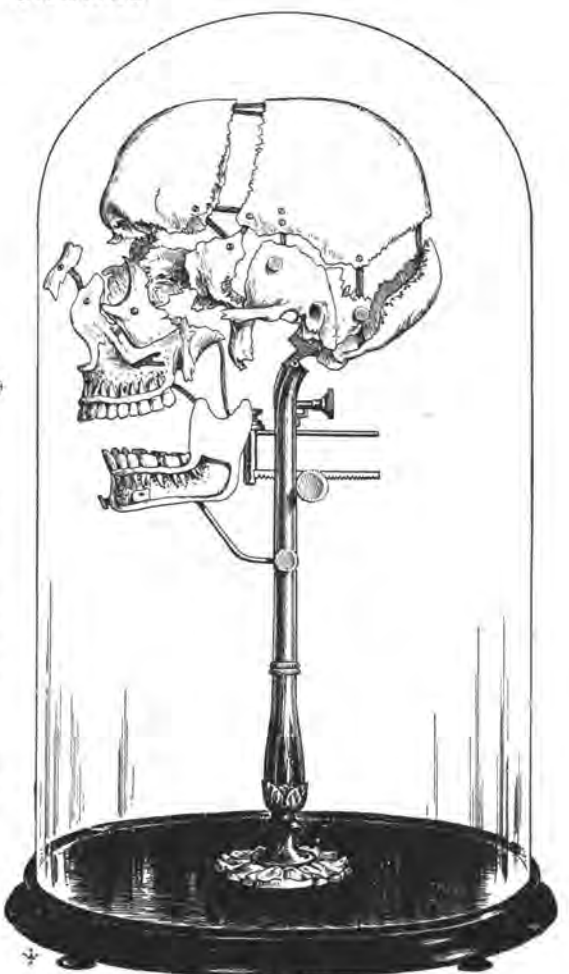
HK–11. Seven-Section Skull.

HK–10. Adult human skull, jaw articulated on springs; cranium with horizontal section showing brain cavity.
Price, $17.00 to $30.00

N.B.—At the present time good human skulls are exceedingly scarce, which has forced up the price. We hope this condition will be only temporary, so later the prices may be reduced.

HK–11. Adult human skull with seven sections, showing sinuses and cranial cavity; temporals are detachable and sectioned, showing the middle and internal ears.
Price $37.50

HK–12. Adult human skull, completely disarticulated, in wooden compartment box. A very fine and useful preparation.
Price $35.00



HK–13

HK–13. Adult human skull, disarticulated and mounted with the bones spaced (a la Beauchene).
Price, without glass globe $65.00
Price with glass globe $75.00

HK–14. Skull of foetus.
Price $5.00

PORTIONS OF SKULLS

HK–20. Superior and inferior maxillaries, with teeth in situ; deciduous dentition; mounted on standard.
Price $17.50

HK–21. Superior and inferior maxillaries as above; permanent dentition.
Price $17.50

HK–30. Temporal Bone.

HK–22. Set of deciduous teeth, mounted in dental arch.
Price $15.00

HK–23. Set of permanent teeth, mounted in dental arch.
Price $15.00

HK–30. Temporal bone opened up to show vestibule, cochlea, semi-circular canal, etc.; on nickel-plated standard.
Price $8.75

HK–31. Temporal bone, sectioned to show middle ear. Tympanic membrane is represented, and the ossicles are shown in position.
Price ..... $8.75.

HK–32. Ossicles of ear, in glass-top box.
Price $3.00

INDIVIDUAL BONES OF SKULL

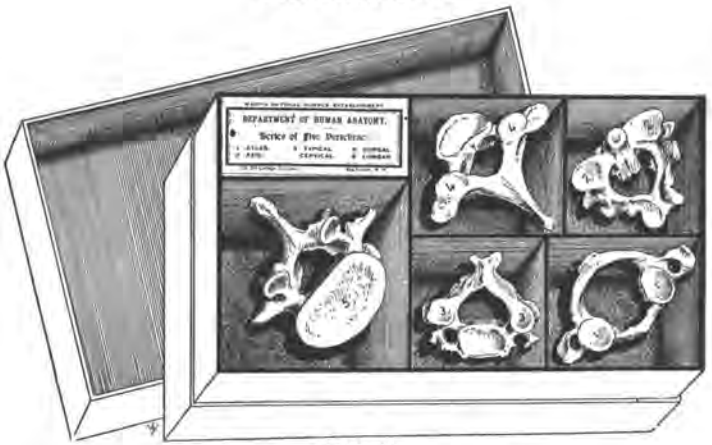
	Young	Adult		Young	Adult
Ethmoid	$4.00	$6.00	Palate	$2.00	$4.00
Frontal	1.50	2.00	Parietal	1.75	2.25
Inferior turbinate	1.00	1.25	Sphenoid	4.00	6.00
Inferior maxillary	3.00	3.50	Superior maxillary	2.00	2.50
Lachrymal	1.00	1.50	Temporal	1.50	2.00
Malar	.75	1.50	Vomer	1.50	2.00
Nasal	.75	.75	Incus	1.00	1.00
Occipital	2.00	2.25	Malleus	1.25	1.25
			Stapes	1.00	1.00

INDIVIDUAL BONES OF THE SKELETON

(Not including skull)

Name	Price	Name	Price	Name	Price
Atlas	$1.00	Hyoid	$3.50	Radius	$1.50
Axis	1.00	Innominate	1.25	Rib	.50
Carpal	.25	Metacarpal	.25	Sacrum	2.50
Clavicle	1.00	Metatarsal	.25	Scapula	2.00
Coccyx	2.50	Proximal phalange	.25	Tarsal	.50
Femur	3.50	Median phalange	.25	Tibia	2.00
Fibula	1.75	Distal phalange	.50	Ulna	1.50
Humerus	2.50	Patella	.75	Vertebra	.50

VERTEBRAE



HK-41

HK-40. Adult human vertebral column strung on sinew.
Price $15.00

HK-41. Series of five vertebrae—atlas, axis, typical cervical, dorsal and lumbar—in neat box with compartments, and with explanatory label. (See cut.)
Price $7.50

HK-42. Thoracic segment. To a single anterior thoracic vertebra is attached the corresponding pair of ribs, the latter being met by their appropriate sternal segment with its cartilaginous ribs. Here, at a glance, are seen the two parallel tubes of the vertebrate body.
Price $7.50

HK-43. Human thorax, to illustrate the mechanism of respiration. This preparation consists of the dorsal vertebrae mounted in an upright attitude, to which are attached the ribs in such manner that they may be simultaneously raised or lowered at will, thus increasing or decreasing the diameters of the thoracic cavity as in life. An object lesson on the effects of tight clothing. On polished hard wood pedestal.
Price $25.00

PELVES

HK-44. Adult pelvis, male or female.
Price $12.50

HK-45. Adult pelvis, male or female, with femora and lumbar vertebrae, as above, and with artificial ligaments, obturator membrane, greater and lesser sacro-sciatic ligaments, capsular ligaments, etc.
Price $20.00

HK-46

HK-46. Female pelvis (with ligaments), containing foetal skull. (See cut.)
Price $25.00

HK-47. Adult human pelvis, male or female—one side with every foramen, process, component bone, etc. accurately labeled; the other side with areas of muscular insertion indicated by colors and labeled.
Price $20.00

HK-48. Human pelvis as above, with component bones dyed each a distinct shade.
Price $20.00

HK–49. Adult female pelvis with foetal skull flexibly connected, allowing an excellent demonstration of all phases of parturition. An obstetric phantom after Dr. Selheim.
Price $90.00

ARMS AND LEGS

HK–50. Adult arm, with hand and shoulder girdle. Bones mounted on cord to allow of separation.
Price $12.50

HK–51. Adult arm and hand, with shoulder girdle (disarticulate), in neat compartment box. Bones numbered to correspond with explanatory label.
Price $12.50

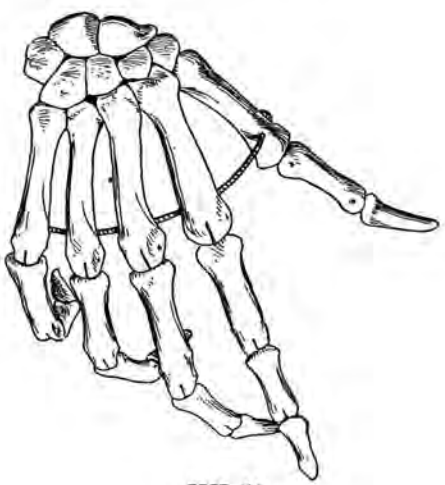
HK–52. Adult hand, strung on cord.
Price $7.50

HK–53. Adult hand, immovably articulated.
Price $7.50

HK–54. Adult hand, movably articulated, phalanges flexible. (See cut.)
Price $10.00

HK–60. Adult leg, with foot and innominate bone on cord to allow of their separation.
Price $12.50

HK–61. Adult leg, with foot and innominate bone disarticulate.
Price $10.00



HK–54

HK–62. Adult foot, strung on cord, allowing bones to be separated or drawn together in their proper places.
Price $6.00

HK–63. Adult foot, immovably articulated.
Price $6.00

B. Skeletons and Parts of Skeletons for Comparative Osteology

It is our claim that no skeletons, either from this country or Europe, are the equal of ours in care of preparation and quality of mounting. All of our skeletons are guaranteed to be free from grease. They are white and clean, and strongly mounted in the natural position. The cuts are all from photographs of stock specimens. Compare them with others.

For over fifty years we have been bringing together skeletons from all over the world, and so have assembled here the largest stock ever offered by any dealer in the world, including a complete series of the Anthropoid apes and such rarities as the Giant anteater, the Echidna, the Passenger Pigeon, etc.

We list here only a few from our stock of over a thousand specimens. If there is any rare form you need the chances are that we have it, be it a humming bird or an elephant. For example, some years ago Dr. Schufeldt published a paper on the osteology of the Passenger pigeon, in which he stated that he knew of only one skeleton that had been preserved. We wrote him we had eight more here.

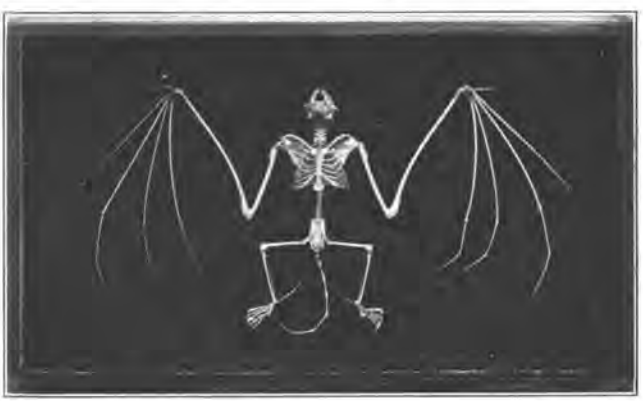
CLASS MAMMALIA

Order Primates

Gorilla Chimpanzee Howler Lemur

	Price
MK–1. Complete mounted skeleton of small monkey	$ 25.00
MK–1a. Skull of monkey, jaw hinged. Price, according to species	$3.00– 10.00
MK–1b. ½ skull of monkey on ebonized panel with label (see page 48 for style of mounting)	$3.00– 8.00
MK–1c. Leg and foot of monkey	5.00
MK–2. Gorilla, male, adult, mounted with clutch standard	500.00
MK–2a. Gorilla, female, adult, mounted with clutch standard	350.00
MK–2b. Gorilla, male skull	$50.00– 75.00
MK–2c. Gorilla, female skull	$40.00– 50.00
MK–9. Lemur, skeleton, complete	30.00
MK–9a. Lemur, skull	5.00
MK–9b. Half skull of Lemur, on ebonized panel, with label	4.00

Order Cheiroptera



MK–10a

	Price
MK–10. Small bat, mounted on stand, with wings spread	$10.00
MK–10a. Small bat, mounted in all-glass-box	15.00
MK–10b. Small bat, mounted in Riker mount	9.00
MK–10c. Small bat wing, mounted in Riker mount	4.00
MK–11. Skeleton of large fruit bat	22.50
MK–11a. Skull of large fruit bat, jaw hinged	5.00
MK–11b. ½ skull of large fruit bat on ebonized panel with label	4.00

Order Insectivora

		Price
MK–12.	**Mole,** mounted on wooden base	$12.00
MK–12a.	**Mole,** mounted in all-glass-box	15.00
MK–12b.	**Leg of mole,** in Riker mount	3.00
MK–12c.	**Skull of mole,** jaws hinged	3.00
MK–13.	**Shrew,** in glass case	12.50

Order Rodentia

MK–20b

		Price
MK–20.	**Rat,** mounted on wooden base	$12.00
MK–20a.	**Rat,** mounted in glass case	15.00
MK–20b.	**Rat,** mounted in Riker mount. Two legs and the ribs of one side are omitted	10.00
MK–20c.	**Skull of rat,** jaw hinged	2.50
MK–21.	**Rabbit,** mounted on wooden base	18.00
MK–21a.	**Skull of rabbit,** jaws hinged	3.00
MK–21b.	**Leg of rabbit,** in Riker mount	2.50
MK–22.	**Muskrat,** skeleton on hard wood base	18.00
MK–22a.	**Skull of muskrat,** jaw hinged	3.00
MK–23.	**Woodchuck,** skeleton on hard wood base	20.00
MK–23a.	**Skull of woodchuck,** jaw hinged	3.00
MK–24.	**Porcupine,** skeleton on hard wood base	25.00
MK–24a.	**Skull of Porcupine,** jaw hinged	3.50
MK–25.	**Beaver,** skeleton on hard wood base	60.00
MK–26a.	**Capybara,** the largest rodent, skull 6 to 7 inches long, with jaw hinged	12.00

Order Carnivora

		Price
MK–30.	**Cat,** mounted on wooden base	$20.00
MK–30a.	**Cat,** mounted in special box, with full descriptive label, giving the name of each bone	25.00
MK–30c.	**Skull of cat,** jaws hinged	3.00
MK–30d.	**Half skull of cat,** on ebonized panel. (See cut, page 48 for style of mounting	3.00
MK–30e.	**Skull of cat,** one half disarticulated and other half left with the bones together, mounted in glass-covered box. (See illustration of turtle skull on page 52 for method of mounting.)	10.00
MK–30f.	**Cat vertebrae,** set of six as follows: atlas, axis, 1 cervical, 1 dorsal, 1 lumbar, 1 caudal—in Riker mount	2.50
MK–30h.	**Leg of cat,** with natural ligaments	3.00

MK–30a

MK–31.	**Dog, skeleton,** on hard wood base	25.00
MK–31a.	**Skull of dog,** jaws hinged, according to size	$3.00– 5.00
MK–31b.	**½ skull of dog** on ebonized panel with label	3.00
MK–31c.	**Leg of dog,** with natural ligaments	4.00
MK–32.	**Fox, skeleton,** on hard wood base	30.00
MK–32a.	**Skull of fox,** with jaws hinged	4.00
MK–33.	**Raccoon,** skeleton, on hard wood base	25.00
MK–33a.	**Skull of raccoon,** jaws hinged	4.00
MK–34a.	**Skull of skunk,** jaws hinged	3.00
MK–35a.	**Polar bear,** skull, jaws hinged	12.00
MK–35b.	**½ skull of Polar Bear,** on ebonized panel, with label. (See cut below for style of mounting.)	10.00

Order Ungulata

MK–44b

MK–42b

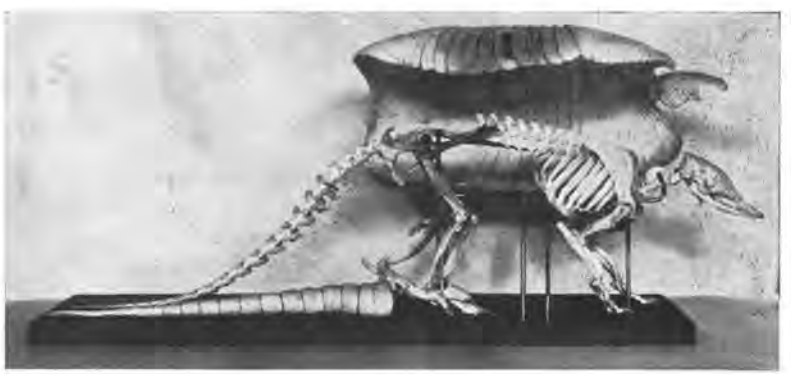
		Price
MK–40.	**Horse, complete skeleton,** on wooden base	$250.00
MK–40a.	**Skull of horse,** with jaws hinged	12.00
MK–40b.	**½ skull of horse** on ebonized panel with label	10.00
MK–40c.	**Leg of horse** mounted on pedestal	15.00
MK–41.	**Cow, complete skeleton,** mounted on hard wood base	225.00
MK–41a.	**Skull of cow,** with jaws hinged	12.00
MK–41b.	**½ skull of cow** on ebonized panel with label	10.00
MK–41c.	**Leg of cow,** mounted on pedestal	15.00

MK–42.	**Sheep,** complete skeleton, mounted on wooden base	75.00
MK–42a.	**Skull of sheep,** with jaws hinged	8.00
MK–42b.	½ **skull of sheep** on ebonized panel with label	7.00
MK–42c.	**Leg of sheep,** mounted on pedestal	8.00
MK–43.	**Pig,** complete skeleton, mounted on wooden base	90.00
MK–43a.	**Skull of pig,** with jaws hinged	10.00
MK–43b.	½ **skull of pig** on ebonized panel with label	8.00
MK–43c.	**Leg of pig,** mounted on pedestal	10.00
MK–44b.	½ **skull of Peccary** on ebonized panel with label	6.00
MK–45a.	**Skull of Hyrax,** with jaws hinged	5.00
MK–45b.	½ **skull of Hyrax** on ebonized panel with label	4.00
MK–46.	**Elephant,** complete skeleton	700.00

Order Cetacea

		Price
MK–60.	**Dolphin,** skeleton mounted on hard wood base	$100.00

Order Edentata



MK–70

		Price
MK–70.	**Armadillo,** skeleton, on wooden base, with carapace hinged so that it can be turned back to show the complete skeleton	$25.00
MK–70a.	**Armadillo,** skull, with jaws hinged	4.00
MK–71.	**Sloth,** skeleton, on base	50.00
MK–71a.	**Sloth** skull, jaws hinged	7.50
MK–71b.	**Sloth** leg, on pedestal	6.00

Order Marsupialia

MK–80.	**Opossum,** skeleton, mounted on wooden base	20.00
MK–80a.	**Opossum** skull, with jaws hinged	4.00
MK–80b.	**Opossum** leg, mounted on pedestal	5.00
MK–81.	**Kangaroo,** skeleton, on base	75.00
MK–81a.	**Kangaroo,** skull, with jaws hinged	7.50

Order Monotremata

MK–91.	**Echidna,** mounted in glass case	50.00
MK–100.	**Collection of eight half skulls** of different orders, each mounted on ebonized panel with full label. (See cut, p. 48.)	35.00
MK–110.	**Collection of six skeletons**—Monkey, Bat, Mole, Rat, Cat, Opossum—mounted on hard wood bases. List price $99.00. Collection price...	90.00

CLASS AVES (BIRDS)

AK–41a

Order Passeres

		Price
AK–1.	**Robin,** skeleton, mounted on perch	$12.00
AK–5a.	**Rhinoplax elliotti,** skull of Hornbill	8.00

Order Picariae

AK–11.	**Woodpecker,** skeleton, on perch	12.00

Order Striges

AK–21.	**Great horned owl,** skeleton, on perch	25.00

Order Psittaci

AK–31.	**Parrot,** skeleton, on perch	20.00

Order Columbae

AK–41.	**Pigeon,** skeleton, on perch	14.00
AK–41a.	**Pigeon,** skeleton, in special box, complete except that only one leg, one wing, and the ribs of one side are shown	13.00
AK–41b.	**Pigeon,** skeleton, disarticulate and mounted in special case with glass top. The natural arrangement is carefully preserved	16.00
AK–41c.	**Pigeon,** one wing and one leg, in Riker mount	3.00

Order Limicolae

AK–61.	**Sandpiper,** skeleton mounted on base	18.00

Order Gaviae

AK–71.	**Gull,** skeleton on base	18.00

Order Grallae

		Price
AK–81.	**Crane,** skeleton mounted on base	$25.00

Order Gallinae

AK–91.	**Chicken,** skeleton mounted on base	18.00
AK–91a.	**Chicken,** skull only	2.00
AK–91b.	**Chicken,** wing only, mounted on base	3.50

Order Accipitres

AK–111.	**Hawk,** skeleton mounted on perch	18.00

Order Anseres

AK–121.	**Duck,** skeleton mounted on pedestal	18.00

Order Herodiones

AK–131.	**Great Blue Heron,** skeleton on base	25.00

Order Steganopodes

AK–141.	**Cormorant,** skeleton on base	20.00

Order Tubinares

AK–151a.	**Albatross,** skull only	7.00

Order Impennes

AK–161.	**Little Penguin,** skeleton on base	20.00

Order Pygopodes

AK–171.	**Grebe,** skeleton on base	18.00

CLASS REPTILIA

Order Squamata

Sub-Order Lacertilia (Lizards).

RK–1.	**Lizard,** 6 to 8 inches, skeleton on wooden base	12.00
RK–1a.	**Lizard,** 8 to 10 inches, in Riker mount, with full descriptive label	15.00
RK–2.	**Hydrosaurus** (lace lizard), over two feet long, mounted on base	25.00
RK–2a.	**Lizard skulls,** various species, large	$5.00– 10.00
RK–3.	**Glass snake,** skeleton on base	30.00
RK–4.	**Gila monster,** skeleton on base	20.00

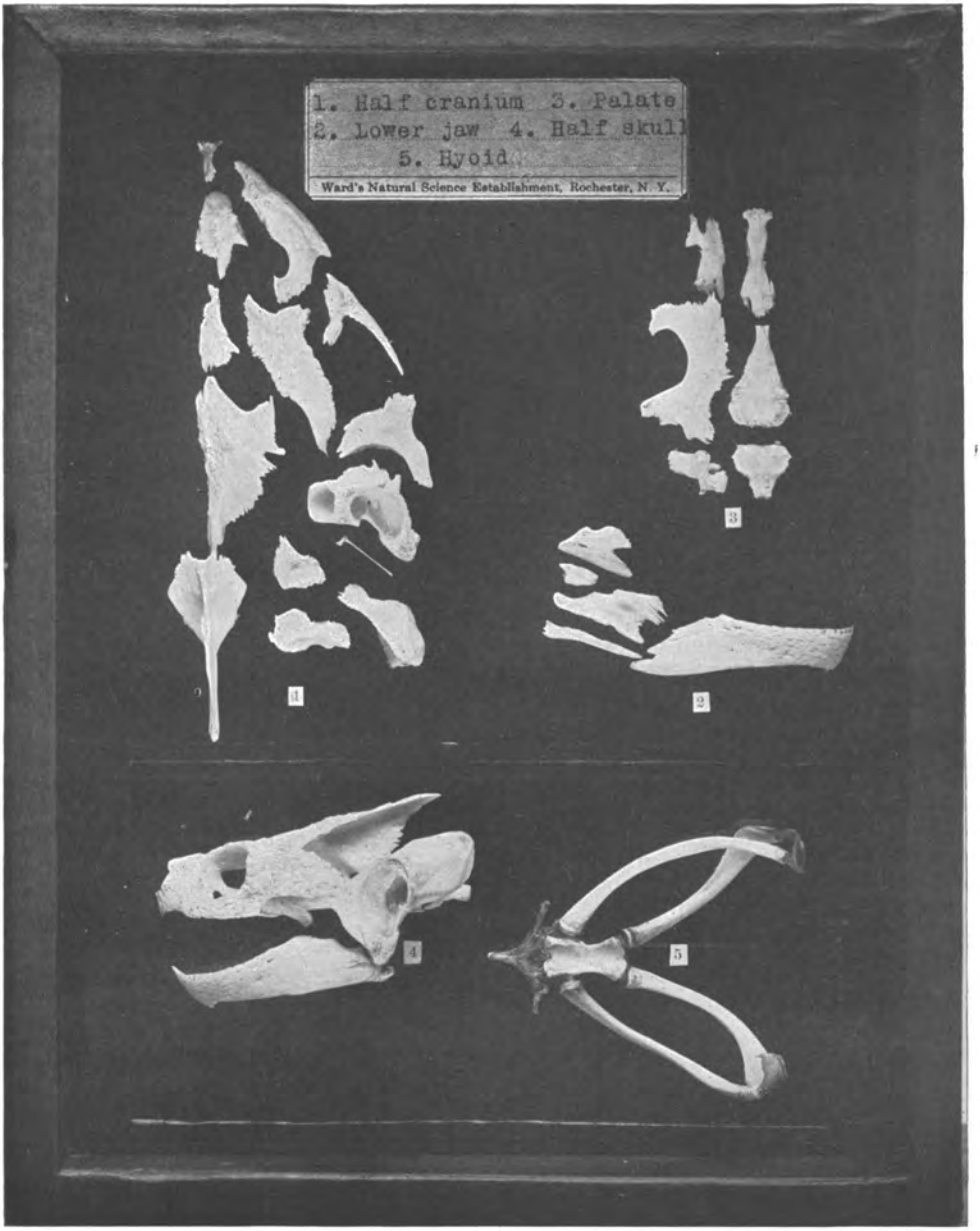
Sub-Order Ophidia (Snakes)

RK–11

RK–11.	**Garter or water snake,** 24 to 36 inches, skeleton on hard wood base	18.00
RK–12.	**Snake,** small, 10 to 15 inches, skeleton in Riker mount	12.00
RK–13.	**Rattlesnake,** skeleton on hard wood base	25.00
RK–13a.	**Rattlesnake,** skull only	6.00
RK–14a.	**Black snake** or other large non-poisonous snake, skull	4.00

Order Chelonia (Turtles).

RK–51.	**Chrysemys picta,** mounted so that plastron opens on hinge, showing all the bones of the skeleton (See cut, page 53.)	$15.00


1. Half cranium 3. Palate
2. Lower jaw 4. Half skull
5. Hyoid
Ward's Natural Science Establishment, Rochester, N. Y.
1
2
3
4
5

RK–54b

RK–51

	Price
RK–51a. Chrysemys picta, in case, with full descriptive label	12.50
RK–52. Snapping turtle (Chelydra serpentina), mounted in same manner as RK–51	20.00
RK–53. Leather turtle, skeleton on standard	18.00
RK–54a. Skull of the large sea turtle, length six inches or over	5.00
RK–54b. Turtle skull, disarticulated and mounted in glass-top box. (See cut, preceding page.)	12.00

Order Crocodilia (Alligators and Crocodiles)

RK–101. Alligator, 2½ to 3 feet, mounted on wooden base	35.00
RK–101a. Alligator, 12 inches long, articulated skeleton mounted in museum jar	12.00
RK–101b. Alligator, 6 to 8 feet long, mounted on base	150.00
RK–101c. Skull of alligator, according to size	$3.00– 10.00
RK–102. Crocodile skull, six inches	7.50
RK–103. Gavial skull, 20 inches	18.00

CLASS AMPHIBIA

Order Anura

	Price
BK–1. Rana catesbiana, very large bull frog, six inches or over in length of body, mounted on hard wood base	$10.00
BK–1a. Rana catesbiana, mounted in special glass-covered box with full descriptive key	12.00
BK–1b. Rana catesbiana, in Hood box	10.00
BK–1c. Rana catesbiana, skull only of large bull frog	2.50
BK–1d. Rana catesbiana, skull one half disarticulated and one half with bones joined, mounted in glass-covered box. (See turtle skull, cut on page 52 for method of mounting.)	10.00
BK–1d. Rana catesbiana, four legs mounted in Riker mount	3.00
BK–2. Green frog, mounted in Riker mount	5.00
BK–3. Bufo americana (Toad), complete skeleton mounted on hard wood base	8.00
BK–4. Bufo americana (Toad), skeleton in Riker mount	5.50

BK–2

Order Urodela

BK–51e

BK–51

Price

BK–51. Necturus maculatus, skeleton mounted in glass museum jar, and showing all the cartilages in their natural condition, mounted on either black or clear glass $15.00

N.B.—We recommend clear glass for study purposes and black glass for exhibition. When ordering kindly specify which is desired.

BK–51a. Necturus maculatus, dried skeleton on wooden base. We do not consider this a satisfactory preparation, as the cartilage contracts and a very wrong idea of the structure is obtained, but we will furnish it if ordered 12.00

BK–51b. Necturus maculatus, skull with hyoid cartilages and gills, mounted in glass jar 5.00

BK–51c. Necturus maculatus, skull only, dry 2.50

BK–51d. Necturus maculatus, chondrocranium, mounted in special nickel-plated sealed mount 7.50

BK–51e. Necturus maculatus, leg cleaned and mounted in our special nickel-plated sealed mount, showing cartilaginous epiphyses and also separation of carpal and tarsal cartilages 5.00

BK–51f. Necturus maculatus, leg cleaned and mounted on glass in screw-cap jar 2.00

BK–51g. Necturus maculatus, vertebrae cleaned and dried 2.50

BK–52. Cryptobranchus alleghaniensis (Hellbender). Complete skeleton showing all cartilages, mounted on black or clear glass in museum jar ... 16.00

BK–52a. Cryptobranchus, skull with hyoid and gill arches, mounted in glass jar 5.00

BK–52b. Cryptobranchus, skull only, dry 3.00

BK–52c. Cryptobranchus, leg cleaned and mounted in screw-cap jar 2.50

BK–53. Amblystoma opacum (Salamander). Complete skeleton showing cartilages, mounted on black or clear glass in museum jar 12.50

PK–1

CLASS PISCES (FISH)

	Price
PK–1. Squalus acanthias or Mustelus canis, complete cartilaginous skeleton, mounted in museum jar	$25.00
PK–1a. Squalus acanthias or Mustelus canis (Dog fish shark), skull with gills, in museum jar	12.00
PK–1b. Squalus acanthias, or Mustelus canis, skull without gills, in screw-cap jar	2.00
PK–2b. The jaw with teeth of the Port Jackson shark (Cestracion philippi). This shark is a survival from Mesozoic time, millions of years ago, and the curious spiral teeth are of the greatest interest	10.00
PK–3. Perca americana (Yellow perch), carefully prepared skeleton of large perch, mounted on wooden base	10.00
PK–3a. Perch skeleton in Riker mount	9.00
PK–4. Amia calva (Mud fish), complete skeleton on wooden base	16.00
PK–4a. Amia calva, skull only, dry	4.00
PK–4b. Amia calva, skull with lateral plates removed to show chondrocranium, mounted in liquid in museum jar	10.00
PK–5. Carp skeleton, good size, mounted on wooden base	16.00
PK–5a. Carp skeleton in glass case	20.00
PK–5b. Carp, skull only, dry	4.00
PK–6. Gar pike (Lepidosteus), a fine preparation in which the skin is left on one side to show the ganoid scales and outer form, while from the other side is seen the complete skeleton	20.00
PK–6a. Gar pike, skull only, dry	4.00
PK–7. Cod fish (Gadus morrhua), complete skeleton, 18 to 24 inches long, mounted on hard wood pedestal	25.00

PK–5a

PK–7a. Cod fish, large skull. Due to its size and structure, very useful for the study of the bones of the skull 12.00

PK–8. Sturgeon, skeleton mounted in liquid in museum jar 25.00

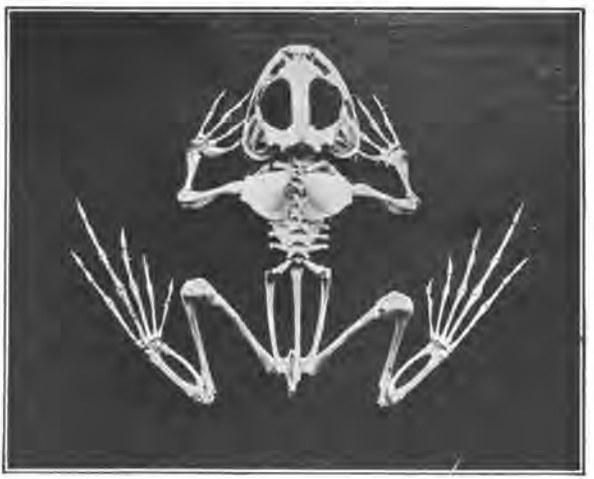
N.B.—This skeleton is not always available.

CLASS CYCLOSTOMATA

CK–1. Lamprey, cartilaginous skeleton in museum jar 25.00

N.B.—This skeleton is not always available.

COLLECTIONS OF SKELETONS



BK–1

Price

SK–1. **Collection of skeletons** for secondary school, containing PK–3a Perch, BK–2 Frog, RK–12 Snake, AK–41a Pigeon, and MK–20b Rat. Each mounted in a Hood box, so that they may be handled without danger of breakage. This series will be carefully packed and delivered to any point in the United States for $50.00

SK–2. **Collection of skeletons for High Schools and Junior Colleges.** It consists of

		List Price
PK–1.	Dog fish shark in museum jar	$25.00
PK–3.	Perch on hard wood base	10.00
BK–51.	Necturus in museum jar	15.00
BK–1.	Large bull frog on hard wood base	10.00
RK–1.	Lizard on hard wood base	12.00
RK–11.	Snake, 24–36 inches, on hard wood base	18.00
RK–13a.	Skull of rattlesnake	6.00
RK–51.	Turtle on hard wood base	15.00
AK–41.	Pigeon on perch	14.00
MK–30.	Cat on hard wood base	20.00
	Packing	2.50
	Total	$147.00

Price for above, f.o.b. Rochester, N. Y. 140.00

SK–10. **Collection of five skulls**—Fish, Frog, Lizard, Bird, and Rat—in Riker mount 8.50

SK–12. **Collection of ½ skulls** for comparison of teeth, particularly for dental schools. Each skull is mounted on ebonized panel, and has a label giving the order, family and dental formula. The series contains Monkey, Lemur, Fruit bat, Hedgehog, Mole, Woodchuck, Beaver, Muskrat, Porcupine, Agouti, Rabbit, Cat, Civet, Fox, Bear, Raccoon, Skunk, Seal, Horse, Pig, Deer, Sheep, Hyrax, Porpoise, Sloth, Anteater, Armadillo, Opossum, Dasyura, Koala, and Kangaroo. 32 skulls in all for 150.00

N.B.—See cut on page 48 for this method of mounting.

SK–21. **Front limbs** of frog, reptile, bird and mammal, mounted in Riker mount 6.00

SK–22. **Wing of bird and wing of bat** mounted together for comparison, in Riker mount 3.50

SK–30. **Collection of vertebrae,** consisting of two each from a fish, frog, alligator, bird and mammal, in Riker mount 3.50

Collections for the Study of Teeth

SK–101. "Teeth" of invertebrates, consisting of
1. The Aristotle's lantern of the Sea urchin
2. The horny jaws of the clam worn, Nereis
3. The radula of the gastropod
4. The radula of the octopus
5. The masticatory apparatus of Limulus
6. The masticatory apparatus of Lobster
7. The masticatory apparatus of Grasshopper

Price

All mounted on a neat ebonized board, with full descriptive labels $20.00

SK–102. Composition of teeth shown by sections of the following, in which the dentine is left uncolored, the enamel is colored red, and the cementum green
1. Molar of horse
2. Canine of bear
3. Tooth of sperm whale
4. Incisor of large rodent

All mounted on ebonized panel, with full descriptive labels 20.00

SK–103. Implantation of teeth, showing various methods of attachment to the jaw
1. In bony sockets—Lower jaw of fox with bone cut away
2. In shallow grooves—Cast of part of fossil jaw of Ichthyosaurus
3. Anchylosis or bone soldering—Cyclodus
4. Acrodont with base of tooth at the summit of a parapet of bone—Uromastix
5. Attachment by ligaments—Angler or another fish of this type

All mounted on ebonized panel with full descriptive labels 40.00

SK–104. Series of Teeth
1. Monophyodont, one series—Armadillo
2. Diphyodont, two series—Skull of cat with milk dentition, and jaw cut away to show permanent teeth ready to replace
3. Polyphyodont. Jaw of shark having many series

All mounted on ebonized panel with full descriptive labels 25.00

SK–105. Method of growth of teeth
1. Persistent growth—Boar's tusk
2. Temporary growth—Hippopotamus

Both teeth are sectioned and colored, and mounted on ebonized panel, with full descriptive labels 15.00

SK–106. Placement of teeth
1. Teeth absent—Snapping turtle
2. Teeth on upper jaw only—Frog
3. Teeth on posterior part of jaw only—Sloth
4. Lacking teeth on front of lower jaw—Deer
5. Teeth continuous on edges of both jaws—Peccary
6. Teeth on edges of both jaws and also on various other bones of the mouth—Pike or Cod

All mounted on ebonized panel, with full descriptive label 40.00

SK–107. Forms of teeth, showing adaptation to work required
1. For offence and defence—Saw of sawfish
2. For prehension—Certain snakes
3. For crushing—Pavement teeth of ray
4. For cutting—Coyote
5. For gnawing—Porcupine
6. For grinding—Cow or horse
7. For straining or sifting—Baleen of whale

All mounted on ebonized panel with full descriptive label 40.00

SK–108. Typical dentition of Mammalian orders shown by half skulls mounted with jaws open, on ebonized panel

Primate, Monkey. Cheiroptera, Bat. Insectivora, Hedgehog. Carnivora, Fox. Rodentia, Porcupine. Ungulata, Sheep. Cetacea, Porpoise. Edentata, Armadillo. Marsupialia, Oppossum 60.00

SK–110. Collection known as a "Chapter on Teeth," consisting of collections SK–101 to 108, together with seven additional preparations illustrating other points, all mounted on one ebonized panel, with full descriptive labels. An interesting and instructive collection 300.00

SECTION IV.

MATERIAL FOR EXHIBITION AND DEMONSTRATION

In this section it is our aim to include such material as would naturally be placed in a college or school museum, and taken from there to the class rooms for demonstration purposes. No large and expensive groups are mentioned. We are, however, glad at all times to quote on special museum exhibitions.

A. MAMMALIA; MOUNTED SPECIMENS

The Duckbill Platypus

A few of those usually in stock are given, but many others can be furnished.

Order Primates

		Mounted skins
MT–1.	**Monkey,** various species	$20.00–$50.00
MT–2.	**Lemur,** various species	$25.00–$50.00

Order Cheiroptera

	Price
MT–10. Large Fruit Bat (Pteropus edwardsi)	$18.00

Order Insectivora

MT–20. Madagascar hedgehog (Hemicentetes spinosus)	15.00
MT–21. Mole	6.00

Order Rodentia

MT–30. Squirrel (Sciurus carolinensis)	7.50
MT–31. Flying Squirrel (Sciuropterus volans)	7.50
MT–32. Woodchuck (Marmota monax)	15.00
MT–33. American Porcupine (Erethizon dorsatus)	25.00
MT–34. American Beaver (Castor canadensis)	75.00

Order Carnivora

MT–40. Puma (Felis concolor)	150.00
MT–41. Bob cat (Lynx rufus)	40.00
MT–42. Coyote (Canis latrans)	50.00

Order Ungulata

MT–14. Hyrax	40.00
MT–15. Rocky Mountain Goat	150.00

Order Sirenia

MT–16. Cast of skull of Manatee, colored after nature	25.00

Order Cetacea

MT–17. Cast of Porpoise (Delphinus delphus), colored after nature, four feet	60.00

Order Edentata

MT–18. Giant Ant-eater (Myrmecophaga jubata)	150.00
MT–19. Hoffman's Sloth (Choloepus hoffmani)	60.00
MT–20. Armadillo	25.00

Order Marsupialia

MT–21. Opossum (Didelphys virginianus)	18.00

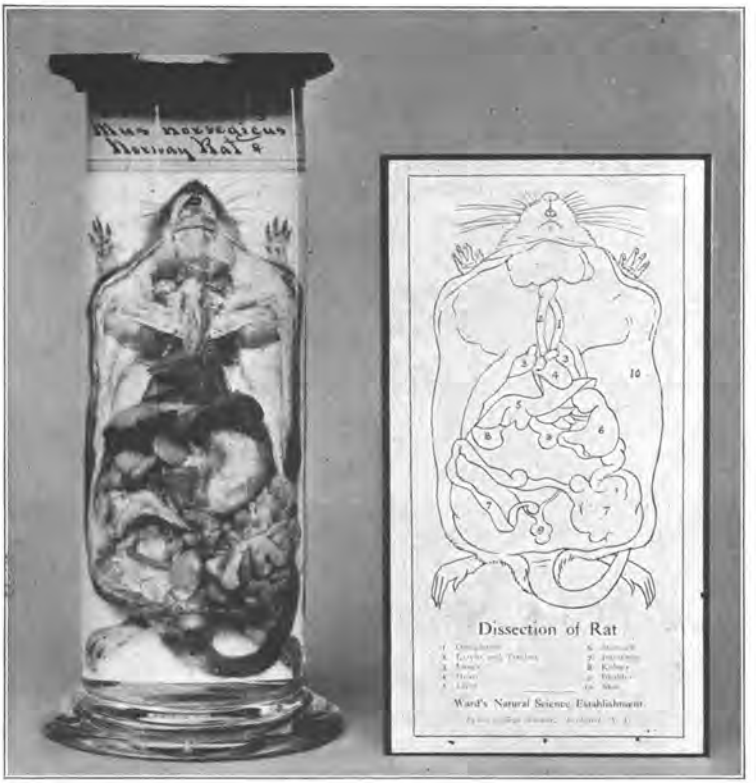
Order Monotremata

MT–22. Echidna (Echidna aculeata), in glass case	50.00

N.B.—We can also supply study skins with skulls attached of many of the smaller mammals such as

Squirrel	3.00
Flying Squirrel	3.00
Chipmunk	2.50
White-footed mouse	1.50
Pocket Gopher	2.50
Bat	2.00
Mole	2.00

B. MAMMALIA; ANATOMICAL PREPARATIONS



Situs Dissection of Rat

To dissect a specimen so as to show all the important organs requires expert knowledge of anatomy and expert technique. Our preparations are all made here and we are glad to submit them for comparison with any on the market.

The cut above is from a photograph of a stock preparation.

MD–1. Situs dissection of rat, in museum jar, with full descriptive label $9.00

MD–10. Brain of rat, in glass jar 2.50

MD–11. Brain of cat, in glass jar 3.00

MD–12. Brain of dog, in glass jar 4.00

MD–13. Brain of sheep, in glass jar, see cut, page 64. ..... 5.00

MD–14. Brain of opossum, in glass jar 5.00

N.B.—See pages 63, 66, 69 and 74 for similar preparations of the other classes of vertebrates.

See pages 76 to 91 for invertebrates.

C. AVES; SKINS AND MOUNTED SPECIMENS

Plover

Our stock of bird skins from both the United States and other countries, is the result of fifty years of collecting, and comprises a very large series. These are kept mostly in the form of skins, which can be relaxed and mounted when ordered. We list here only a few of the birds on the A.O.U. check list, supplemented by some interesting forms not found in this country, but are always glad to quote on the rarer forms.

A.O.U. No.		Study Skin	Mounted Skin
6	Pied-billed Grebe	$ 2.50	$ 6.00
34	Dovekie	2.50	6.00
51a	Herring Gull	5.00	10.00
70	Common Tern	3.00	7.50
139	Green-winged Teal	4.00	8.00
144	Wood duck	10.00	15.00
190	American Bittern	4.00	8.00
201	Little Green Heron	3.00	7.50
214	Carolina Rail or Sora	2.50	5.00
221	American Coot	3.00	7.50
230	Wilson's Snipe	2.50	5.50
263	Spotted Sandpiper	2.00	4.50
273	Kildeer Plover	2.50	5.00
274	Semi-palmated Plover	2.00	4.00
289	Quail or Bob-white	2.50	5.00
300	Ruffed Grouse	5.00	10.00
315	Passenger Pigeon, male and female		250.00
316	Mourning Dove	3.00	6.00
332	Sharp-shinned Hawk	3.00	7.50
343	Broad-winged Hawk	3.50	8.00
360	Sparrow Hawk	3.00	6.00
364	Osprey	6.00	18.00
366	Long-eared Owl	4.00	10.00
367	Short-eared Owl	4.00	10.00
373	Screech Owl	3.00	6.00
375	Great Horned Owl	7.00	18.00
377a	Hawk Owl	6.00	10.00

A.O.U. No.		Study Skin	Mounted Skin
387	Yellow-billed Cuckoo	2.00	4.50
388	Black-billed Cuckoo	2.00	4.50
390	Belted Kingfisher	2.00	4.50
393	Hairy Woodpecker	1.50	4.00
394	Downy Woodpecker	1.25	4.00
402	Yellow-bellied Sapsucker	1.50	4.00
406	Red-headed Woodpecker	1.50	4.00
412	Flicker	1.50	4.00
420	Night Hawk	2.50	5.00
423	Chimney Swift	1.50	4.00
428	Ruby-throated Humming bird	2.50	5.00
444	King bird	1.25	4.00
452	Crested Flycatcher	1.50	4.00
456	Phoebe	1.25	4.00
461	Wood Pewee	1.25	4.00
467	Least Flycatcher	1.00	3.50
474b	Prairie Horned Lark	1.25	4.00
477	Blue Jay	1.50	4.00
486	American Raven	6.00	12.00
488	American Crow	2.50	6.00
493	Starling	1.50	4.00
494	Bobolink	1.50	4.00
495	Cow bird	1.50	4.00
498	Red-wing Black bird	1.25	4.00
501	Meadow Lark	2.00	4.50
507	Baltimore Oriole	1.50	4.00

A.O.U. No.		Study Skin	Mounted Skin
509	Rusty Black bird	1.25	4.00
510	Brewer's Black bird	1.25	4.00
511	Purple Grackle	1.50	4.00
515	Pine Grosbeak	2.00	5.00
517	Purple Finch	1.50	3.50
519	House Finch	1.50	3.50
521	American Crossbill	2.00	4.50
528	Redpoll	1.00	3.50
529	American Gold Finch	1.25	3.50
533	Pine Siskin	1.00	3.50
534	Snow Bunting	1.25	4.00
536	Lapland Longspur	2.00	4.50
540	Vesper Sparrow	1.00	3.50
542a	Savannah Sparrow	1.00	3.50
546	Grasshopper	1.25	3.50
552	Lark Sparrow	1.25	3.00
554	White-crowned Sparrow	1.25	3.50
558	White-throated Sparrow	1.00	3.50
559	Tree Sparrow	1.00	3.50
560	Chipping Sparrow	1.00	3.50
563	Field Sparrow	1.00	3.50
567	Junco	1.00	3.50
581	Song Sparrow	1.00	3.50
584	Swamp Sparrow	1.00	3.50
585	Fox Sparrow	1.25	4.00
587	Towhee	1.25	4.00
593	Cardinal	1.25	4.00
595	Rose-breasted Grosbeak	1.50	4.00
596	Black-headed Grosbeak	1.50	4.00
598	Indigo Bunting	1.50	3.50
604	Dickcissel	1.25	4.00
608	Scarlet Tanager	1.50	4.00
610	Summer Tanager	2.00	4.50
611	Purple Martin	2.50	5.00
612	Cliff Swallow	1.25	4.00
613	Barn Swallow	1.25	4.00
614	Tree Swallow	1.25	4.00
616	Bank Swallow	1.25	3.50
617	Rough-wing Swallow	1.50	4.00
619	Cedar Waxwing	1.25	4.00
620	Phainopepla	1.25	4.00
622	Loggerhead Shrike	1.25	4.00
624	Red-eyed Vireo	1.00	3.50
627	Warbling Vireo	1.50	4.00
628	Yellow-throated Vireo	1.25	3.50
631	White-eyed Vireo	1.50	4.00
636	Black & White Warbler	1.00	3.50
645	Nashville Warbler	1.00	3.50
648a	Northern Parula Warbler	1.00	3.50
652	Yellow Warbler	1.00	3.50
654	Black-throated Blue Warbler	1.25	3.50
655	Myrtle Warbler	1.00	3.50
657	Magnolia Warbler	1.25	3.50
659	Chestnut-sided Warbler	1.00	3.50
660	Bay-breasted Warbler	2.00	4.00
661	Black-poll Warbler	1.00	3.50
662	Blackburnian Warbler	1.50	4.00
667	Black-throated Green Warbler	1.00	3.50
671	Pine Warbler	1.25	3.50
672a	Yellow Palm Warbler	1.00	3.50
673	Prairie Warbler	1.25	3.50
674	Oven bird	1.00	3.50
675	Water Thrush	1.50	4.00
677	Kentucky Warbler	1.50	4.00
681	Maryland Yellow-throat	1.00	3.50
683	Yellow-breasted Chat	1.50	4.00
685	Wilson's Warbler	1.50	4.00
686	Canadian Warbler	1.50	4.00
687	Redstart	1.25	3.50
697	American Pipit	1.50	4.00
703	Mocking bird	1.50	4.00
704	Cat bird	1.25	4.00
705	Brown Thrasher	1.50	4.00
721	House Wren	1.50	4.00
722	Winter Wren	1.50	4.00
725	Long-billed Marsh Wren	1.50	4.00
726	Brown Creeper	1.00	3.50
727	White-breasted Nuthatch	1.00	3.50
728	Red-breasted Nuthatch	1.00	3.50
731	Tufted Titmouse	1.00	3.50
735	Chickadee	1.00	3.50
747	Golden-crowned Kinglet	1.00	3.50
749	Ruby-crowned Kinglet	1.00	3.50
751	Blue-gray Gnatcatcher	1.25	3.50
754	Townsend's Solitaire	1.50	4.00
755	Wood Thrush	1.50	4.00
756	Veery	1.50	4.00
759b	Hermit Thrush	1.25	3.75
761	Robin	1.25	4.00
766	Blue bird	1.25	3.75

AT–1

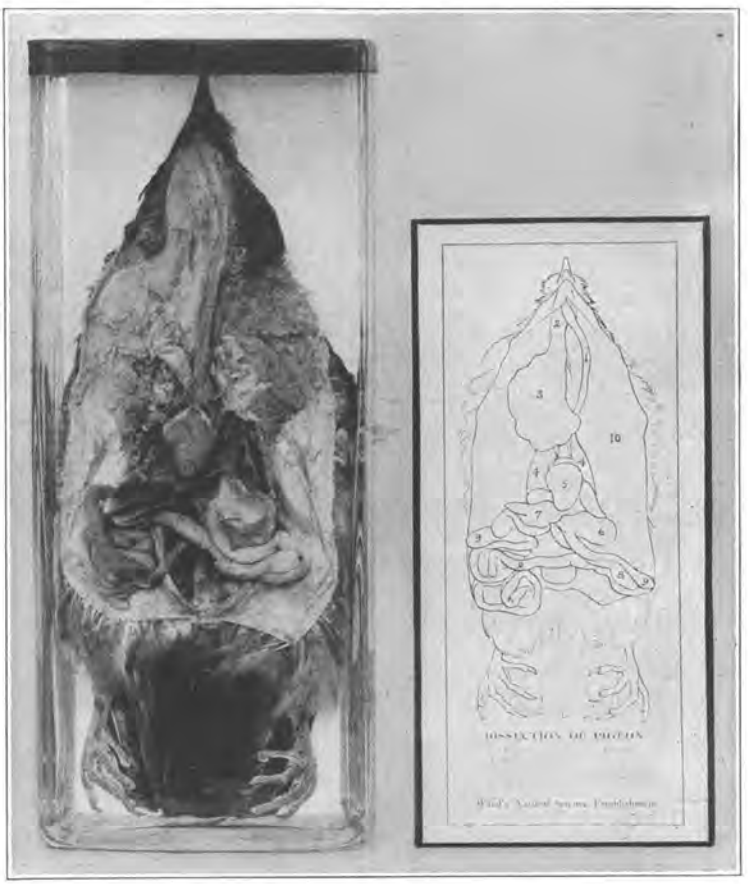
		Price
AT–1.	**Nine types of birds' feet,** mounted on pedestal	$ 8.00
AT–2.	**Six heads of birds,** selected to show the types of bills, mounted on board	8.00

AT–10. Collection of twenty scientific bird skins, representing the commoner birds of the principal orders 50.00
AT–11. Collection of twenty mounted specimens of birds, selected as above 100.00
AT–15. Collection of 15 single eggs of 15 species of birds 5.00

A Few Foreign Birds Selected for Color or Form

The Hornbill, mounted skin 25.00
The Mandarin Duck (the most beautiful of all ducks), mounted skin 15.00
The Owl Parrot of Australia (now nearly extinct) 15.00
The Riffle bird (one of the birds of Paradise) 20.00

D. AVES; ANATOMICAL PREPARATIONS



AD–1

		Price
AD–1.	**Situs dissection of pigeon,** in museum jar, with full descriptive label	12.00
AD–2.	**The complete digestive system of the chicken,** dissected out and mounted in museum jar (see cut, page 64)	9.00
AD–11.	**Brain of chicken,** in glass jar	2.50
AL–1.	Life history of chick, showing five stages, mounted in museum jar. (See cut, page 70.)	15.00

GM–2
(See page 74.)

AD–2
(See page 63.)

MD–13
(See page 60.)

E. REPTILIA; COLORED CASTS

The older museums have found from experience that mounted skins of reptiles, amphibians and fishes are not satisfactory, as the colors fade and the skins crack. For this reason plaster and wax casts taken from actual specimens in the flesh and colored after nature, are being used more and more. We started such a series for the Brooklyn Museum many years ago and have gradually added to it as opportunity arose. The following are a few of those we can supply

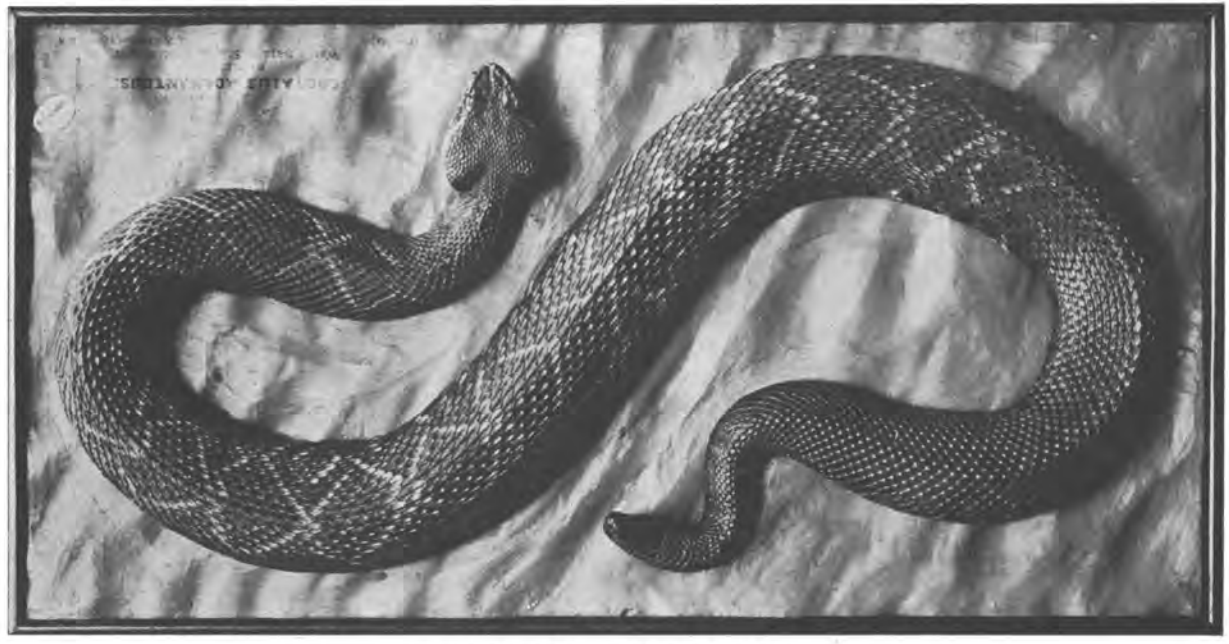
RT–41

Colored casts	Price
RT–1. Gila monster (Heloderma suspectum), 1 ft. 8½ in.	$25.00
RT–2. Crested lizard (Corythophanus cristatus), Costa Rica	18.00
RT–3. Chameleo vulgaris (Chameleon), Africa	18.00
RT–10. Diamond-back Rattlesnake, Florida, 6 ft.	35.00
RT–11. Rattlesnake (Crotalus horridus), 3 ft. 6 in.	25.00
RT–12. Copperhead (Ancistrodon contortrix)	20.00
RT–13. Water mocassin (Ancistrodon piscivorus)	25.00

Louisiana State Museum

Dear Sir: New Orleans, La.

"We would be pleased to have you send us a cast of the Water Moccasin on sanded base. The Members of the Board of Curators who have seen the first cast you sent us are delighted with it and we will gradually get the whole list." Robert Glenk, Secretary.



RD–10. Diamond-Back Rattler.

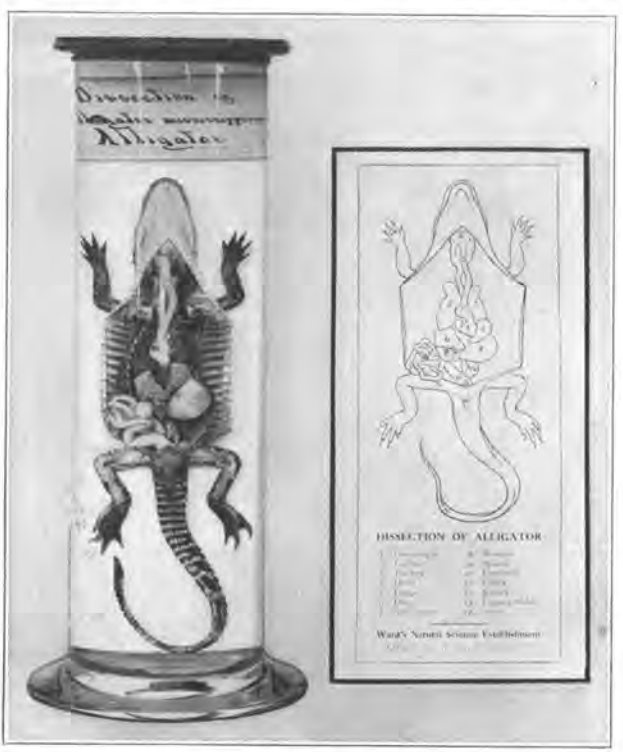
Brooklyn Institute of Arts and Sciences

Dear Mr. Ward: Brooklyn, N. Y.

"I enclose an order for the cast of the big shark. * * * The Matamata was fine. It is one of the cases I am fond of citing where the artificial is better than the real." F. A. Lucas, Curator-in-chief.

RT–14.	**Lachesis mutus** (Bushmaster), Trinidad	30.00
RT–15.	**Vipera aspis** (the asp)	20.00
RT–16.	**Clotho arietans** (Puff adder), Africa	25.00
RT–17.	**Boa constrictor,** 32 in.	25.00
RT–18.	**Heterodon platyrhinus** (Hog-nosed snake)	20.00
RT–19.	**Water snake** (Tropodonotus fasciatus)	18.00
RT–20.	**Milk snake** (Ophibolus doliatus)	18.00
RT–21.	**Ribbon snake** (Eutaenia saurita)	18.00
RT–22.	**Garter snake** (Eutaenia sirtalis)	18.00
RT–23.	**Pine snake** (Pityophis sayi), 5 ft. 5 in.	25.00
RT–24.	**Spectacled Cobra** (Naja tripudians), with head raised and spread, showing pattern, 5 ft. 3 in.	40.00
RT–40.	**Painted turtle** (Chrysemys picta)	15.00
RT–41.	**Wood turtle** (Chelopus insculptus)	18.00
RT–42.	**Soft-shell turtle** (Aspidonectes spinifer)	18.00
RT–43.	**Snapping turtle** (Chelydra serpentina)	25.00
RT–44.	**Diamond-back terrapin** (Malacoclemys macrospilota)	18.00
RT–45.	**Mata mata** (Chelys mata mata)	35.00

F. REPTILIA; ANATOMICAL PREPARATIONS AND WET MOUNTS



RD–1

		Price
RD–1.	**Situs dissection of alligator,** in museum jar, with full descriptive label	$ 9.00
RD–10.	**Brain of snake,** in glass jar	4.00
RD–11.	**Brain of small alligator,** in glass jar	4.00

Anatomical Preparations (continued).

		Museum Jar
RD–12.	**Brains** of typical specimens of the five classes of vertebrates, mounted in museum jar. (See cut, page 74)	15.00
RD–13.	**Hearts** of typical specimens of the five classes of vertebrates in museum jar. (See cut, page 64)	10.00
RL–1.	**Life history of lizard,** five stages, in museum jar	6.00

REPTILES MOUNTED IN GLASS JARS

These specimens are mounted in natural positions on either opal or black glass plates, and are then placed in either museum or patent screw-cap jars and sealed. For illustrations of these jars see page 75.

Lacertilia

		Patent Jar	Museum Jar
RM–1.	**American chameleon** (Anolis carolinensis)	$1.00	$2.50
RM–2.	**Collared lizard** (Crotaphytus collaris)		4.00
RM–3.	**Fence lizard** (Sceloporus undulatus)	1.00	2.50
RM–4.	**Gila monster** (Heloderma suspectum)		15.00
RM–5.	**Horned toad** (Phrynasoma sp.)	1.00	2.50
RM–6.	**Skink** (Eumeces fasciatus)	1.00	2.00
RM–7.	**Glass snake** (Ophisaurus ventralis)		10.00

Ophidia

		Museum Jar
RM–10.	**Ring-neck snake** (Diadophis punctatus)	$ 2.50
RM–11.	**Garter snake** (Eutaenia sirtalis)	4.00
RM–12.	**Rattlesnake** (Crotalus)	15.00
RM–12a.	**Rattlesnake,** head dissected to show poison apparatus and fangs	8.00
RM–13.	**Copper head** (Ancistrodon)	8.00
RM–14.	**Coral snake** (Elaps fulvus)	8.00
RM–15.	**Worm snake** (Typhlops)	5.00

Crocodilia

RM–21.	**Alligator,** 9 to 12 inches	5.00

G. AMPHIBIA; COLORED CASTS

BT–13

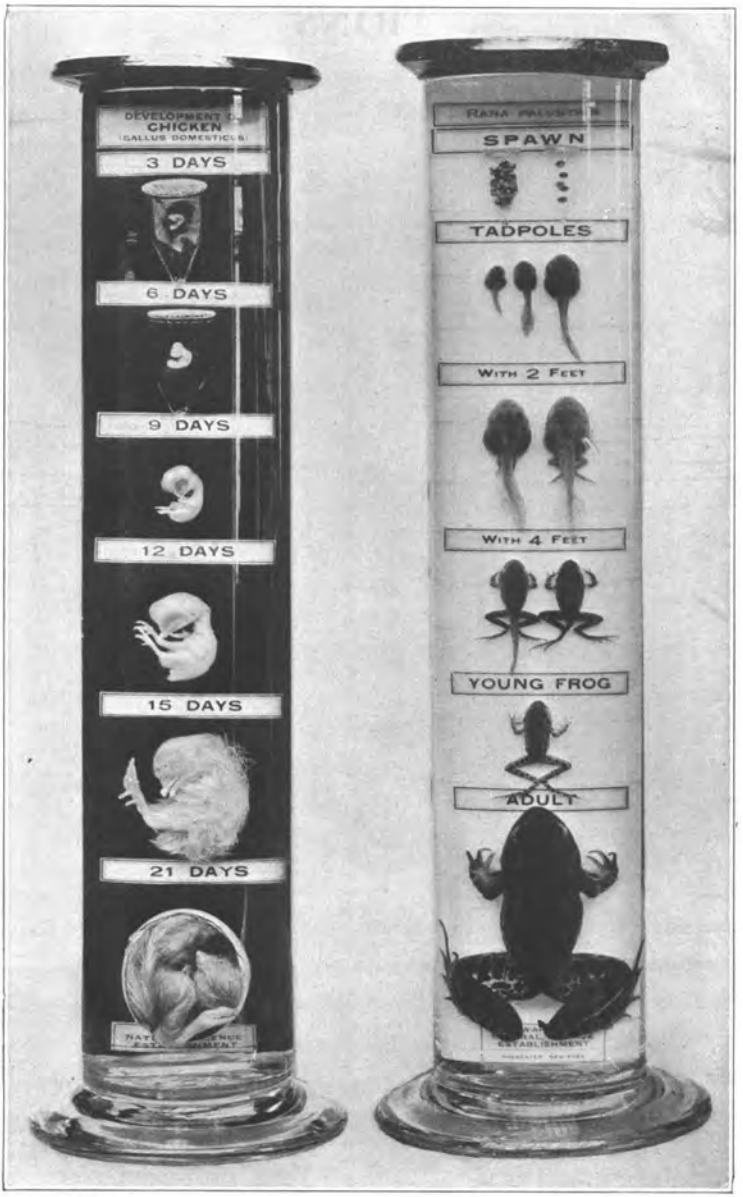
		Museum Jar
BT–1.	**Necturus maculatus** (Mud puppy)	$20.00
BT–2.	**Cryptobranchus alleghaniensis** (Menopoma)	20.00
BT–3.	**Amphiuma means**	15.00
BT–11.	**Scaphiopus holbrooki** (Spade-foot toad)	12.00
BT–12.	**Bufo americanus** (Toad)	12.00
BT–13.	**Rana sylvatica** (Wood frog)	12.00
BT–14.	**Hyla versicolor,** group of three specimens showing change of color for protective coloration	25.00
BT–20.	**Rhacophorus** tephraemystax (African tree toad)	12.50
BT–21.	**Pipa americana** (Surinam toad), Brazil	15.00

H. AMPHIBIA; ANATOMICAL PREPARATIONS

BD–1

		Museum Jar
BD–1.	**Dissection of frog.** Situs dissection with full descriptive card	$ 6.50
BD–2.	**Dissection of frog,** to show complete nervous system	7.00
BD–3.	**Dissection of Necturus.** Situs dissection in glass jar	9.00
BD–10.	**Brain of frog,** in glass jar	2.00
BD–11.	**Brain of Axolotl**	2.00
BL–1.	**Life history of grass frog,** showing eleven stages, in museum jar. (See cut, page 70.)	8.00
BL–2.	**Life history of grass frog,** as above. Reduced size, giving seven stages, in museum jar	6.50
BL–3.	**Life history of toad,** seven stages, in museum jar	7.50
BL–4.	**Life history of salamander,** six stages, in museum jar	6.00

Life Histories in Glass Jars



AL–1 (See page 63). **BL–1** (See page 69).

I. AMPHIBIA MOUNTED IN GLASS JARS

RM–10

BM–1

Urodela

		Patent Jar	Museum Jar
BM–1.	**Amblystoma punctatum**	$ 1.00	$3.00
BM–2.	**Amblystoma larvae.** Axolotl, large		3.00
BM–3.	**Amphiuma**		8.00
BM–4.	**Cryptobranchus allegheniensis**		5.00
BM–5.	**Diemyctylus viridescens.** Newt.	.75	2.00
BM–6.	**Desmognathus fuscus**	.75	2.00
BM–8.	**Necturus maculatus**		4.00
BM–9.	**Plethrodon glutinosus**	.75	2.00
BM–10.	**Siren lacertina**		5.00

Anoura

BM–21.	**Scaphiopus holbrooki** (Spade-foot toad)		4.00
BM–22.	**Bufo americanus** (common toad)	.75	2.00
BM–23.	**Acris gryllus**	.75	2.00
BM–24.	**Hyla pickeringii**	.75	1.50
BM–25.	**Hyla versicolor** (Tree frog)	.75	2.00
BM–26.	**Eurystomus carolinensis**	.75	1.50
BM–27.	**Rana sylvatica** (Wood frog)	.75	1.50
BM–28.	**Rana pipiens** (Grass frog)	.75	1.50
BM–29.	**Rana clamitans** (Green frog)		3.00
BM–30.	**Rana palustris** (Marsh frog)		3.00
BM–31.	**Rana catesbiana** (Bull frog)		4.00

J. FISH, COLORED CASTS

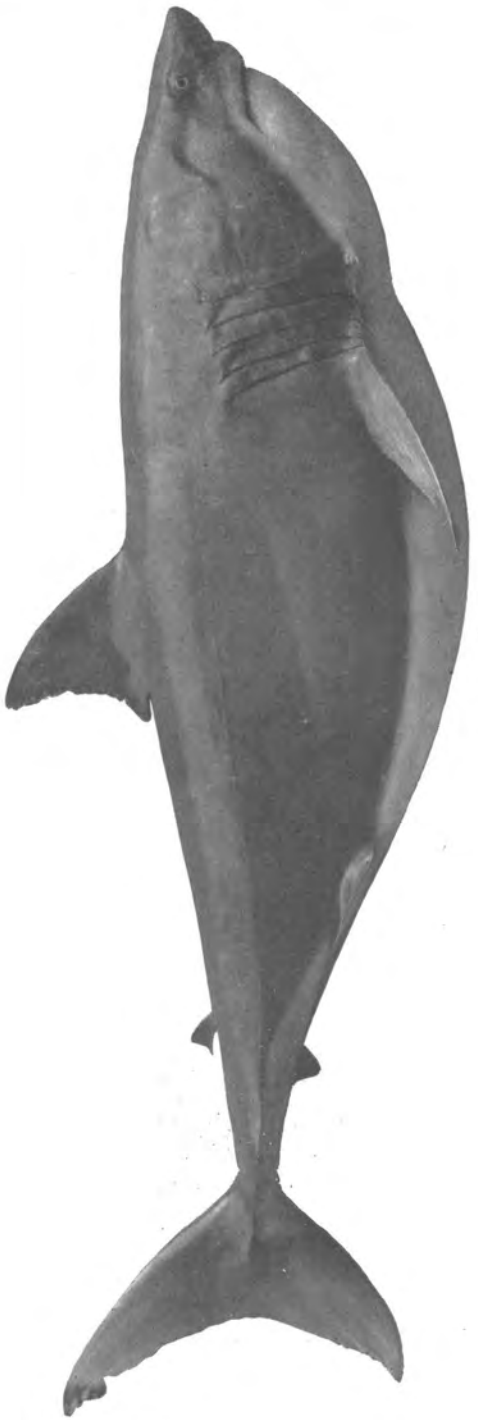
CLASS PISCES AND CYCLOSTOMATA

PT–1. Petromyzon marinus (Sea lamprey) ..... $ 15.00
PT–5. Carcharodon carcharias (Man-eating shark), 13½ ft. long. (See cut.) ... 250.00
PT–6. Alopias vulpes (Thresher shark), 12 ft. 3½ in. 200.00
PT–7. Squalus acanthias (Dog fish), 2 ft. 11 in. 20.00
PT–8. Heterodontus phillipi. The Port Jackson shark is a survival from Paleozoic time. This is a cast showing both sides, arranged to hang from above. It was made from a specimen at the United States National Museum. Length, 28 inches 25.00
PT–9. Anguilla chrysopa (Eel) 20.00
PT–10. Polyodon spathula (Paddle fish) 25.00
PT–11. Amia calva (Dog fish) 20.00
PT–12. Lepidosteus osseus (Gar pike), 3 ft. 6 in. 25.00
PT–13. Scaphirhynchus platyrhynchus (Shovel-nose sturgeon) 20.00
PT–14. Acipenser rubicundus (Lake sturgeon), 3 ft. 2 in. 20.00
PT–15. Anarchias lupus (Wolf fish) 20.00
PT–16. Salvelinus fontinalis (Speckled trout) 18.00
PT–17. Esox masquinongy (Muskellunge), 2 ft. 4 in. 25.00
PT–18. Ameiurus nebulosus (Bull head) 15.00
PT–19. Cyprinus carpio (Carp) 20.00
PT–20. Mola mola (Sunfish), 4 ft. x 3 ft. 125.00
PT–21. Gadus morrhua (Codfish) 25.00
PT–22. Eupomotis gibbosus (Pumpkin seed) 15.00
PT–25. Lepidosiren paradoxa. The original of this cast was made by the American Museum of Natural History from a breeding male 36 inches long. It is mounted on a wooden pedestal 25.00
PT–26. Protopterus annectens. This lung fish is also from an original made by the American Museum from a specimen that lived several weeks in the aquarium in New York City. It is 13 inches long and mounted on a wooden base 15.00
PT–27. Polypterus bichir. Length 25½ inches. Cast of one side of the fish, arranged for hanging on the wall. Another American Museum cast. This is the sole survivor of the order Crossopterygii, which at one time included hundreds of species 15.00

We add a few restorations of prehistoric fish. These restorations, with the exception of Drepanaspis, were made by the American Museum of Natural History, under the direction of Dr. Hussakof, and so can be accepted as correct.

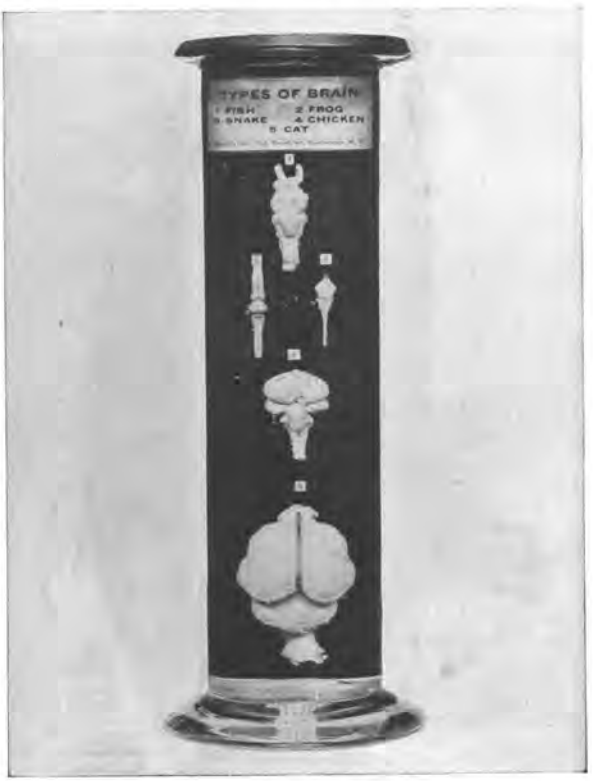
PT–40. Cladoselache fyleri, length 32 inches, mounted on pedestal 20.00
PT–41. Pleuracanthus gaudryi, length 19½ inches, mounted on pedestal 20.00
PT–42. Pteraspis rostrata, length 9 inches, on slab 10.00
PT–43. Pterichthys milleri, length 6 inches, on pedestal 10.00
PT–44. Coccosteus decipiens, length 15½ inches, mounted on pedestal 12.00
PT–45. Drepanaspis. A German restoration of this interesting and curious fish 15.00
PT–46. Semionotus agassizi, length 12½ inches, on pedestal 15.00

N.B.—See pages 158–161 for cuts.



PT-5. Man-eating Shark.

K. FISHES, ANATOMICAL PREPARATIONS AND SPECIMENS IN MUSEUM JARS



GM–1

		Price
PD–1.	**Situs dissection of perch,** in museum jar, with full descriptive label	$ 6.50
PD–2.	**Squalus, dissection of head** to show brain and nerves, mounted on glass, in museum jar	6.00
PL–1.	**Life history of trout,** seven stages, mounted on glass, in museum jar	7.00
PM–1.	**Lamprey,** in museum jar	4.00
PM–2.	**Hagfish,** in museum jar	8.00
PM–3.	**Dogfish (Squalus),** pup with nourishment sac attached, in museum jar	4.00
PM–4.	**Gar pike** (Lepidosteus), in museum jar	5.00
PM–5.	**Eel,** in museum jar	5.00
PM–6.	**Hippocampus,** dry, in Riker mount	2.50
PM–7.	**Balloon fish,** dry	2.50
GM–1.	Types of brains. This preparation contains the brains of 1. Fish; 2. Frog; 3. Snake; 4. Chicken; 5. Cat; mounted on black glass in museum jar. (See cut)	15.00
GM–2.	Types of hearts. This preparation contains the hearts of the same series of animals, mounted on opal glass in museum jar. (See cut on page 64.)	10.00

L. CEPHALOCHORDA AND INVERTEBRATA PREPARED FOR EXHIBITION AND DEMONSTRATION

All this work is done here by our skilled technicians. We guarantee our preparations and invite comparison with the work of others. The cuts used were all taken from photographs of our preparations and show the care used in properly placing the specimens.

In preparing material for exhibition and demonstration we have four methods of mounting and use the one best adapted to the material.

A. In Museum jars permanently sealed with a special cement and with tops covered with stretched bladder and painted black.

B. In patent jars made from the best quality of clear glass with a screw cap with patent lining. This assures a water tight joint. When jars are used, the specimens are usually fastened to a glass plate, either clear, opal or black as specified by our customers. If the kind of glass is not specified, we use that which in our judgment gives the best results.

C. In Riker Mounts or all glass mounts.

D. On hardwood blocks.

A. Museum Jar

B. Patent Jar

C. Riker Mount

D. Hardwood Block

C. All Glass Mount

N.B.—We are ready to supply any of this material unmounted at a much lower price.

CEPHALOCHORDA

		Patent Jar	Museum Jar
CM–1.	**Amphioxus**	.50	

SUB–PHYLUM UROCHORDA (ASCIDIANS)

UM–1.	**Molgula** (the common sea squirt)	.50	1.50
UM–2.	**Corella** (the Glassy Tunicate)	1.00	2.50
UM–3.	**Pyrosoma** (Fire body)	2.50	3.50
UM–4.	**Salpa aggregata,** very fine	1.00	2.00

SUB–PHYLUM HEMICHORDA

HM–1.	**Balanoglossus**	1.00	2.50

PHYLUM; ARTHROPODA

Class Crustacea

Subclass Branchiopoda

		Patent Jar	Museum Jar
IM–1.	**Branchipus vernalis,** the fairy shrimp	.75	
IM–2.	**Lepidurus,** a larger phyllopod from the West	.75	
IM–3.	**Daphnia sp.** water flea	.75	

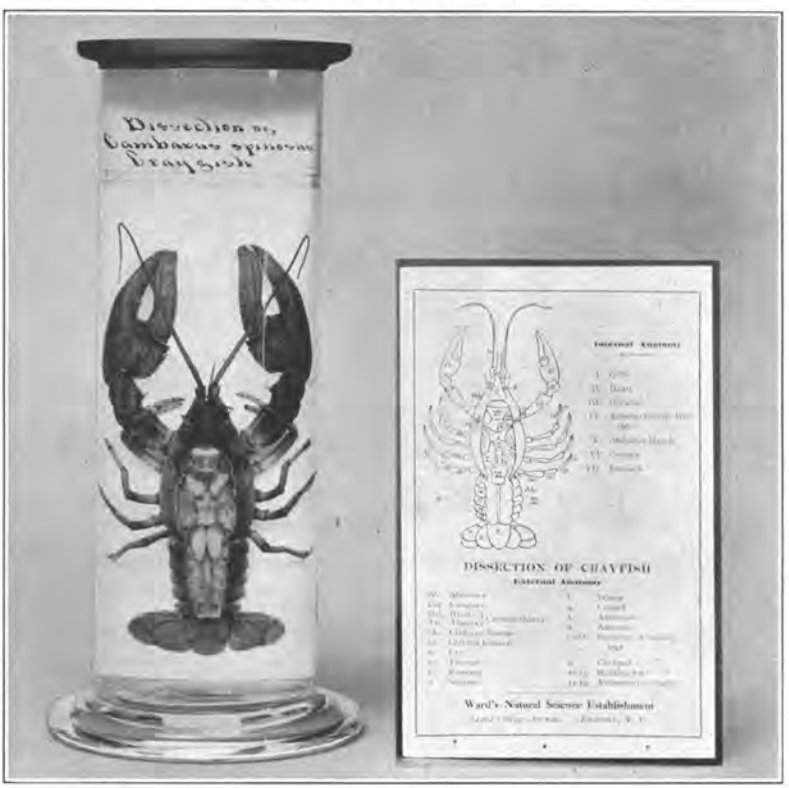
Subclass Copepoda

IM–10.	**Cyclops** water lice	.75	
IM–11.	**Argulus** water lice	.75	

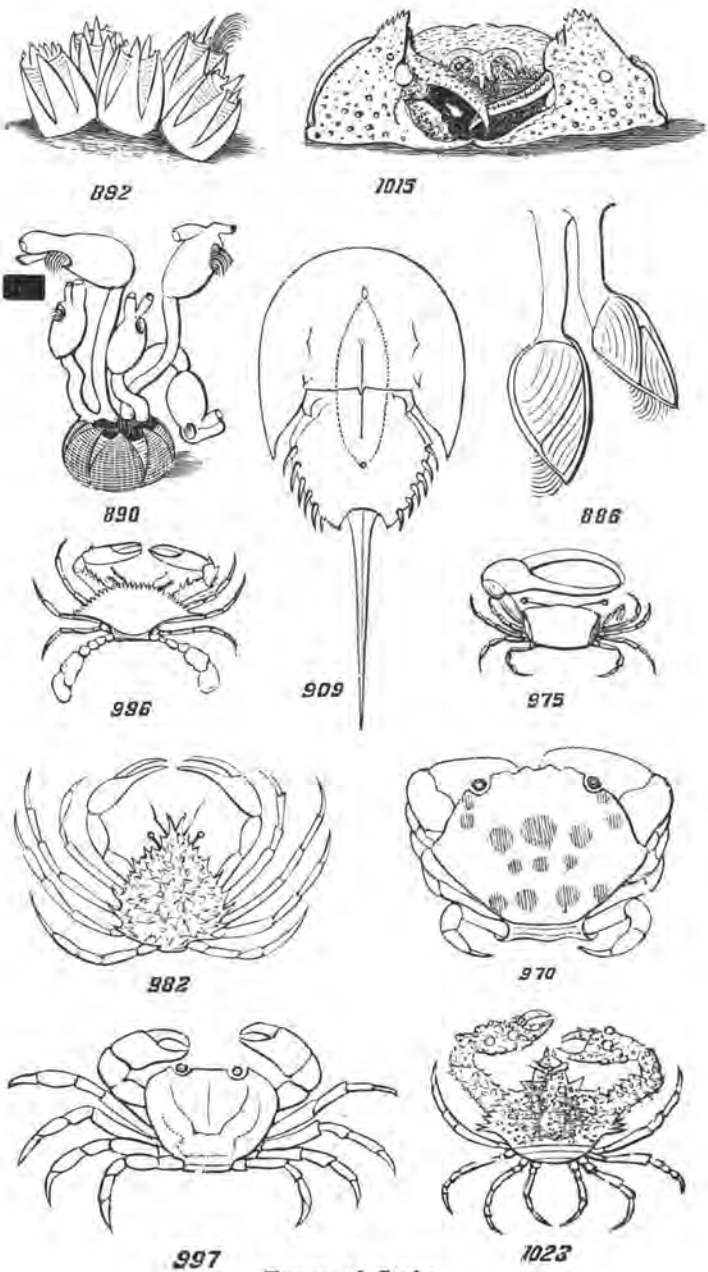
Subclass Cirripedia (The Barnacles)

IM–20.	**Balanus balanoides** (The acorn barnacle)	.75	
IM–21.	**Lepas fascicularis** (Goose barnacle with stalk)	1.50	

Subclass Malacostracea



IM–30.	**Anaspides tasmaniae** (a representative syncarid)		4.50
IM–31.	**Cymothoa.** A parasite from fish's mouth	.75	
IM–32.	**Ligia.** Isopod from Florida	.75	
IM–33.	**Oniscus.** The sow bug	.75	
IM–34.	**Caprella.** A curious little amphipod	.75	
IM–36.	**Squilla.** The best known of the Stomatopoda	1.50	4.00
IM–37.	**Callinectes.** A swimming crab	1.50	4.00
IM–38.	**Cancer.** The rock crab	1.50	4.00
IM–39.	**Cambarus** (The common crayfish, 3″ spec.)	.75	larger 3.00
IM–39a.	**Cambarus, Female with eggs**	1.00	3.00



Types of Crabs.

Malacostracea—continued.

		Dry	Patent Jar	Museum Jar
IM–39b.	**Cambarus. Situs dissection** with full descriptive label			$6.50
IM–39c.	**Cambarus. Blood system** injected, dissection			6.50
IM–39d.	**Cambarus. Dissection** to show nervous system			6.50
IM–39e.	**Cambarus. Life history,** 8 stages			8.00
IM–40.	**Crangon vulgaris.** Edible shrimp		.75	
IM–41.	**Pagurus.** The hermit crab		1.00	3.00
IM–42.	**Potamobius.** A very large crayfish from the West			4.00
IM–43.	**Uca (Gelasimus) pugilator.** The fiddler crab, male and female		1.00	
IM–44.	**Hippa talpoides.** The mole crab		.75	
IM–45.	**Homarus americanus.** The lobster, mounted dry	$8.00		

Class Arachnoidea

IM–64

IM–60.	**Limulus polyphemus,** the king crab		$ 1.50	$ 3.00
IM–60a.	**Limulus polyphemus,** large, mounted dry	$ 5.00		
IM–61.	**Centrurus,** large scorpion from California		1.00	3.00
IM–62.	**Thelyphonus giganteus,** whip scorpion		1.50	4.00
IM–63.	**Tarantula spider**		1.50	3.00
IM–63a.	**Tarantula spider,** dry in Riker mount	1.50		
IM–64.	**Cteniza california.** Trap door spider with nest in glass top box	1.50		
IM–65.	**Argiope riparia.** Garden spider in Riker mount	1.00		
IM–66.	**Collection of ten genera of spiders** in Riker mount	5.00		
IM–67.	**Margaropus annulatus,** sheep tick		.75	

		Dry	Patent Jar	Museum Jar
	Class Myriapoda			
IM–70.	**Scolopendra,** large centipede		$1.50	$3.00
IM–71.	**Lithobius,** small northern centipede		.75	
IM–72.	**Spirobolus marginatus,** large millepede		.75	
IM–73.	**Julus,** small millepede		.75	
	Class Onychophora			
IM–80.	**Peripatus** from New Zealand		2.00	

Class Insecta

See pages 95 to 105.

PHYLUM; MOLLUSCA

IM–100

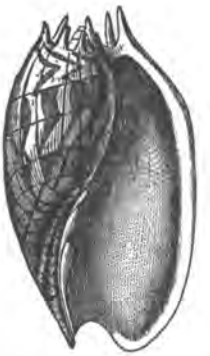
IM–80

	Class Amphineura. The Chitons			
IM–100.	**Ischnochiton conspicuus.** Valves spaced to show structure, in Riker mount	$3.00		
IM–101.	**Chiton tuberculata.** Large chiton with animal		$1.25	
IM–102.	**Collection of five chiton** shells representing different genera in Riker mount	2.50		
	Class Scaphopoda			
IM–105.	**Dentalium,** shell with animal		1.00	
	Class Gastropoda, Univalve Shellfish			
	Order Aspidobranchia			
IM–110.	**Scurria gigantea** (California limpet)		1.00	
IM–111.	**Collection of ten genera of limpets** in Riker mount	5.00		
IM–112.	**Haliotis** animal in shell (The Ear Shell)		1.50	3.00
IM–113.	**Trochus maximus.** Shell dry (see cut)	.75		
	Order Pectinibranchia (Most of the Marine Univalves)			
IM–120.	**Buccinum undatum.** The common whelk shell with animal		1.00	
IM–121.	**Cypraea tigris.** The tiger cowry	.50		
IM–121a.	**A collection** of ten different species of cowries, considered the most beautiful of the marine shells, each in a separate tray with label	3.50		
IM–122.	**A collection** of ten different species of Cone shells as above	3.50		
IM–123.	**Strombus gigas.** Large Conch shell	2.00		
IM–124.	**Melo diadema** (see cut, next page)	1.50		
IM–125.	**Mitra episcopalis** (see cut, next page)	.50		
IM–126.	**Vermetus spiratus** (see cut, next page)	.50		

IM–126

IM–125

IM–113



IM–124

(N.B.—Collections of other genera similar to IM–121a and IM–122 can be supplied.)

IM–127

	Dry	Patent Jar	Museum Jar
IM–127. Pterotrachea mutica. A Heteropod (see cut)		1.00	
Order Opisthobranchia			
IM–130. Aeolis sp. A nudibranch or Sea Slug		1.00	
IM–131. Aplysia. The sea hare, a tectibranch		1.25	
IM–132. Hyalaea tridentata. Sea butterfly. A Pteropod		1.00	
Order Pulmonata; Land Snails and Slugs			
IM–140. Helix pomatia the large edible snail of Europe		1.50	3.00
IM–141. Polygyra. The common land snail of the Eastern U. S.		1.00	
IM–142. Limax. The garden slug		1.00	2.50
IM–143. Obba rota, the wheel shell	.25		
IM–144. Helicostyla ventricosa, tree-snail	.25		
IM–145. Strophocheilus oblongus	.75		
IM–146. Collection of forty species of land shells, each in an individual tray in a cardboard box	10.00		

IM–145

IM–143

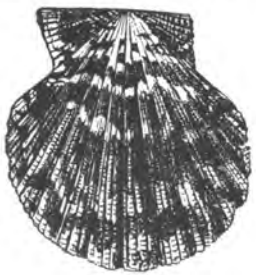
IM–144

(If interested in the Mollusca write for our 125 page shell catalogue.)

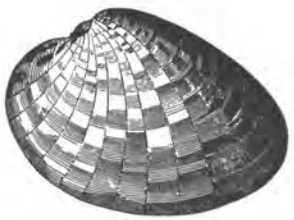
Class Pelecypoda (Bivalve Molluscs)

IM–200a

		Patent Jar	Museum Jar
IM–200.	**Lampsilis.** Fresh water mussel, one valve removed to show animal, mounted in jar. A complete shell, dry, furnished with this	1.50	3.00
IM–200a.	**Dissection** of fresh water mussel with full descriptive label		6.50



Scallop



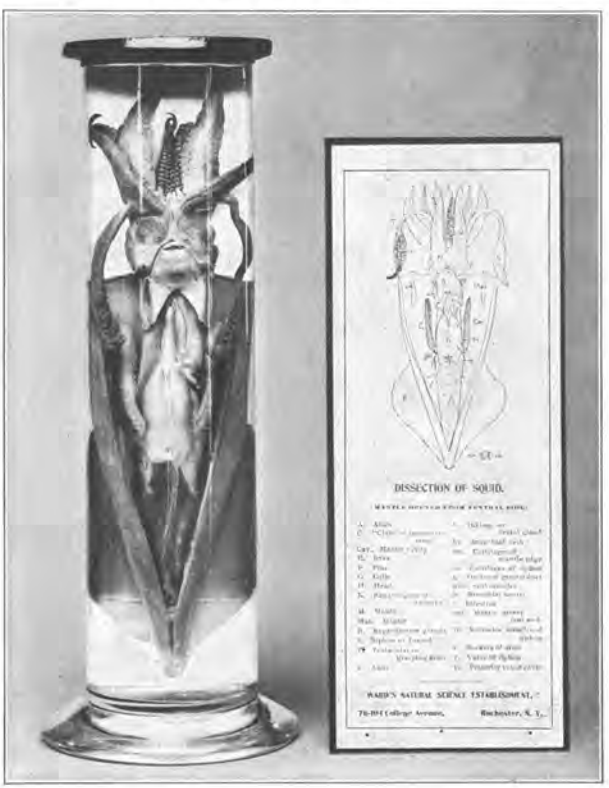
Venus

Cockle

		Dry	Patent Jar	Museum Jar
IM–201.	**Mya arenaria.** Long neck clam		1.00	3.00
IM–202.	**Mytilus edulis.** Edible mussel		1.00	3.00
IM–203.	**Ostraea virginica,** one valve removed to show animal. A complete dry shell is also furnished		1.50	3.50
IM–204.	**Venus mercenaria.** Little neck clam, as above		1.50	3.50
IM–205.	**Teredo navalis.** The shipworm in wood showing borings		1.00	
IM–210.	**Collection** of twenty genera of Pelecypoda each in tray with label	5.00		

Class Cephalopoda

IM–250.	**Loligo.** The squid		1.50	3.00
IM–250a.	**Loligo.** Situs dissection with label			6.00



Argonauta

Nautilus

		Dry	Patent Jar	Museum Jar
IM–251.	**Octopus.** According to size			3.00–15.00
IM–252.	**Eledone,** similar to Octopus but with a single row of suckers on each arm			5.00
IM–253.	**Sepiola.** The cuttle fish		1.50	3.00
IM–254.	**Argonauta.** The beautiful Argonaut shell, with animal. This is not always available. (See cut)			10.00
IM–255.	**Nautilus.** The pearly nautilus shell, complete, in the natural state. (See cut)	3.00		
IM–255a.	**Nautilus,** decorticated and polished. This has the appearance of mother of pearl	4.00		
IM–255b.	**Nautilus,** one-half of shell only, showing siphuncle	3.00		
IM–255c.	**Nautilus,** one-half of shell only, without siphuncle	1.50		
IM–260.	**Collection** of 100 Mollusca each in a tray 3 x 4 cm. in box with label in top	15.00		
IM–260a.	**Collection** of 150 Mollusca, larger, each in an individual tray with scientific and common name and locality where found	30.00		

N.B.—Larger collections up to 1000 species furnished. Quotations upon request.

Brachiopoda

IM–270.	**Lingula anatina.** A member of a family going back hundreds of millions of years		1.50	
IM–271.	**Terebratalia transversa** from West Coast		2.00	
IM–272.	**Laqueus californicus.** The lamp shell		2.00	3.00

List of dry specimens upon request.

Bryozoa

IM–275.	**Bugula turrita,** a marine form superficially like the hydroids		1.00	
IM–276.	**Retepora.** Lace coral		1.00	
IM–277.	**Membranipora,** dry in glass top box	.75		

ANNELIDA

Class Polychaeta

		Patent Jar	Museum Jar
IM–280.	**Amphitrite ornata.** (See cut, page 85.)	1.00	2.00
IM–281.	**Aphrodite aculeata.** The sea mouse, large		3.50
IM–282.	**Hermione,** a smaller sea mouse	1.50	2.50
IM–283.	**Arenicola,** lug worm in glass tube	1.50	
IM–284.	**Clymenella,** sand worm	1.00	
IM–285.	**Nereis virens,** green clam worm	1.00	2.00
IM–285a.	**Nereis,** from Naples. A smaller form	.75	
IM–286.	**Spirorbis** shells only on sea weed	.75	

Class Oligochaeta

IM–287.	**Lumbricus terrestris,** the common earth worm in glass tube	.75	
IM–287a.	**Earthworm** dissection in Museum jar with label. (see cut)		5.50

Class Hirudinea

IM–290.	**Large leech**	1.00	

Class Gephyrea

IM–295.	**Phascolosoma,** a Gephyrean worm	1.00	
IM–296.	**Phoronis** from Japan	1.50	

NEMATHELMINTHES. THE ROUND WORMS

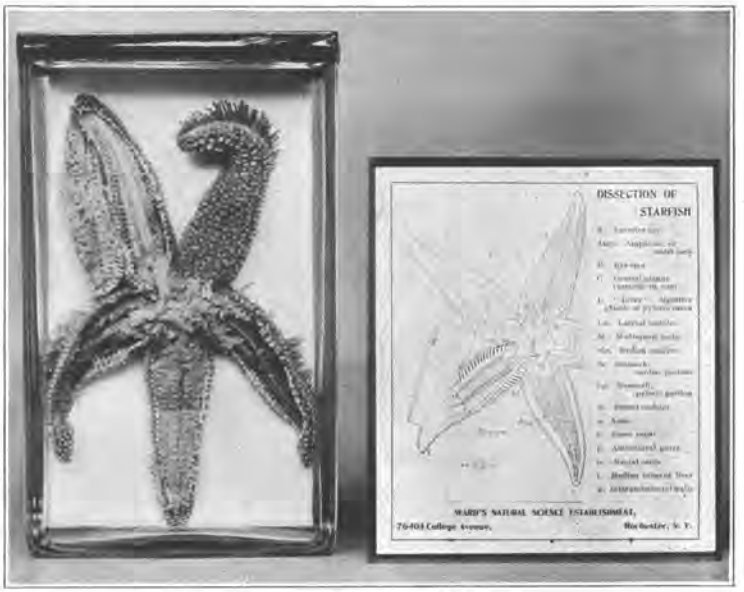
IM–300.	**Ascaris lumbricoides.** Male and female mounted together	1.25	3.00
IM–301.	**Gigantorhynchus**	1.25	3.00
IM–302.	**Ancylostoma.** Hook worm from India	.75	
IM–303.	**Sagitta.** Arrow worm	.75	

IM–327

IM–280

PLATYHELMINTHES. THE FLAT WORMS

		Patent Jar	Museum Jar
	Class Turbellaria		
IM–310.	**Bdelloura candida** in vial	.75	
IM–311.	**Leptoplana tremellaris** in vial	.75	
IM–312.	**Thysanozoon brocchi,** a marine turbellarian	1.00	2.50
IM–313.	**Yungia,** a larger species	1.50	3.00
	Class Trematoda		
IM–320.	**Fasciola hepatica,** the liver fluke	1.00	
IM–321.	**Tristomum papillosum**	1.00	
	Class Cestoda. The Tape Worms		
IM–325.	**Taenia with scolex,** mounted on black glass		10.00
IM–326.	**Monezia expansa,** with scolex, the sheep tape worm, mounted on black glass		3.00
IM–327.	**Dipylidium caninum, complete.** Tape worm from dog mounted on black glass. See cut.		3.00
	Class Nemertinea		
IM–330.	**Cerebratulus.** The best known Nemertean worm	1.50	
IM–331.	**Nemertes** from the Mediterranean, in tube	1.00	



IM–370

ECHINODERMATA

Class Crinoidia

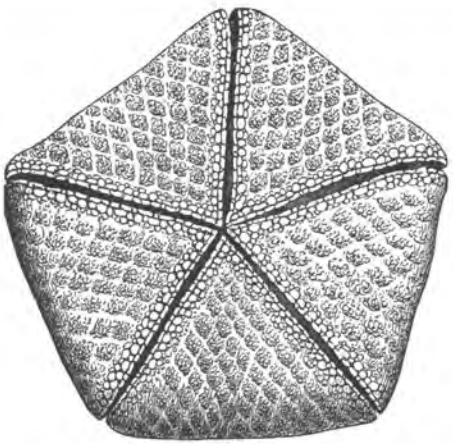
		Dry	Patent Jar	Museum Jar
IM–350.	**Antedon rosaceus.** Feather star from Mediterranean		3.00	4.00
IM–351.	**Metacrinus rotundus,** stalked crinoid from Japan			15.00
IM–352.	**Comanthus japonicus,** free swimming crinoid from Japan	3.00	3.00	4.00
IM–353.	**Tropiometra macrodiscus,** free swimming crinoid from Japan	3.00	3.00	4.00

Class Ophiuroidea. The Serpent Stars

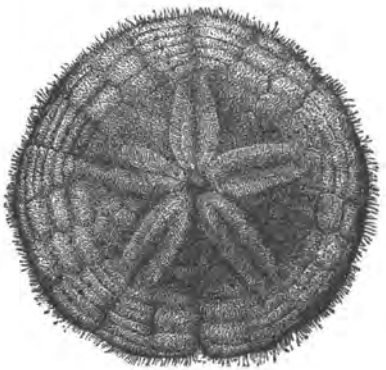
IM–360.	**Astrophyton.** Basket Star fish			12.00
IM–361.	**Opiothrix echinata,** serpent star from the Mediterranean		1.00	2.50
IM–361a.	**Ophiothrix echinata,** specimen dry in glass mount showing both sides. (See cut, page 75.)	2.50		
IM–362.	**Ophiura brevispina,** common serpent star		1.00	2.50
IM–362a.	**Ophiura brevispina,** in all glass mount	2.50		

Class Asteroidea

IM–370.	**Asterias forbesi.** Common Starfish dissection with label in rectangular jar			7.50
IM–370a.	Same in round museum jar			5.00
IM–371.	**Asterias forbesi,** dry on hard wood base	.75		
IM–372.	**Astropecten,** dry on hard wood base	1.50		
IM–373.	**Luidia clathrata,** dry on hard wood base	1.50		
IM–374.	**Culcita pentangularis,** a large starfish with no arms (see cut) dry on base	2.00		
IM–375.	**Oreaster turritus** from Pelew Islands dry on hardwood base	2.00		
IM–376.	**Pentaceros reticulatus,** very large starfish from Florida on hard wood base	2.00		



IM–374

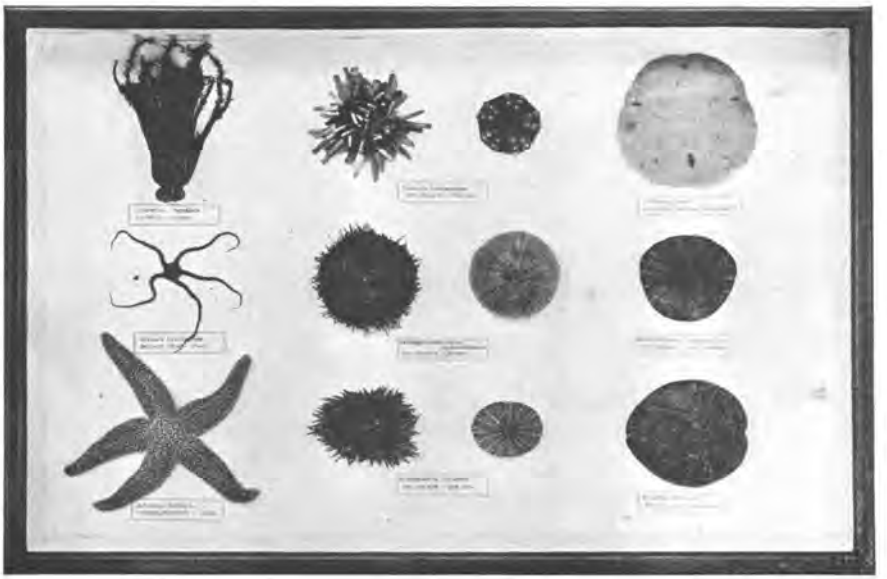


IM–395

Class Echinoidea

		Museum Jar
IM–390.	**Strongylocentrotus drobachiensis.** Dissection with full descriptive label. See cut	6.50
IM–390a.	**Strongylocentrotus,** common green sea urchin, two specimens, one with spines	3.00

IM–390



IM–400

		Dry	Patent Jar	Museum Jar
IM–390b.	**Aristotle lantern** or jaws of the sea urchin in glass top box, dry	2.00		
IM–391.	**Arbacia sp.** Purple sea urchin, 2 specimens mounted as in IM–390			3.00
IM–395.	**Echinarachnius parma,** 2 specimens dry in Riker mount	1.50		
IM–396.	**Dendraster excentrica,** the sand dollar of the Pacific Coast, 2 specimens in Riker mount	1.50		
IM–397.	**Mellita sp.,** a large key hole sea urchin from Central America	.75		
IM–398.	**Brissus ventricosus,** the large and handsome species from the Bahamas, dry on wooden base	1.50		
IM–400.	**Collection of ten Echinoderms,** selected to show the various orders, mounted in wooden exhibition case. See cut	15.00		

Class Holothuroidea

IM–410.	**Cucumaria (Pentacta) frondosa,** the northern sea cucumber		1.25	3.00
IM–410a.	**Dissection of sea cucumber** with full descriptive label			6.50
IM–411.	**Thyone briareus,** the common sea cucumber		1.25	3.00

IM–410a

COELENTERATA

Class Hydrozoa

Order Leptolinae (Including the Antho-medusae and Lepto-medusae)

		Dry	Patent Jar	Museum Jar
IM–500.	**Campanularia,** Hydroid colony		.75	
IM–501.	**Clava,** Hydroid colony growing on sea weed		.75	
IM–502.	**Pennaria** colony		.75	
IM–503.	**Plumularia** colony		.75	
IM–504.	**Sertularian** colony		.75	
IM–505.	**Tubularia** colony		.75	
IM–510.	**Marguerita.** A small medusa		1.00	
IM–511.	**Phialidium.** A medusa		1.00	
IM–512.	**Polyorchis.** A medusa from the Pacific		1.50	

Order Trachylinae

IM–520.	**Gonionemus vertens.** A fine example of a Tracho-medusa		1.00	
IM–521.	**Cunina.** A Narcomedusa		1.00	

Order Hydrocorallina. Hydrocorals

IM–530.	**Millepora,** dry on wood block	1.50		
IM–531.	**Stylaster sanguineus.** A pink branching coral from Samoa, in Riker mount	.75		
IM–532.	**Distichopora nitida,** yellow coral in Riker mount	.75		

IM–535

IM–554

Order Siphonophora. Free Swimming Coelenterates

		Dry	Patent Jar	Museum Jar
IM–535.	**Physalia pelagica.** The Portugese Man of War ...		3.00	6.00
IM–536.	**Vellela spirans,** disc shaped		1.50	3.00

Class Scyphozoa. The Jellyfish

IM–540.	**Aurelia.** A typical jelly fish from the Atlantic		1.50	3.00
IM–541.	**Cotytorhiza.** A handsome jellyfish from the Mediterranean Sea			5.00
IM–542.	**Lucernaria.** A Stauro-medusa		1.25	

Class Anthozoa
Order Alcyonaria

IM–550.	**Corallium rubrum.** The precious coral of commerce from the Mediterranean Sea. A small piece with polyps expanded		4.00	
IM–550a.	**Corallium rubrum.** A small piece, dry in Riker mount	1.25		
IM–551.	**Gorgonia flabellum.** Sea Fan mounted dry on wood block	1.00		
IM–552.	**Pterogorgia setosa,** sea plume mounted dry on wood block	1.00		
IM–553.	**Renilla,** sea pansy, two specimens showing both sides mounted on glass		1.50	3.00
IM–554.	**Pennatula.** The Sea Pen. See cut.		3.00	5.00
IM–555.	**Verillea.** The Sea-whip		2.00	
IM–556.	**Tubipora musica.** Organ pipe coral from Singapore, dry on block	1.25		

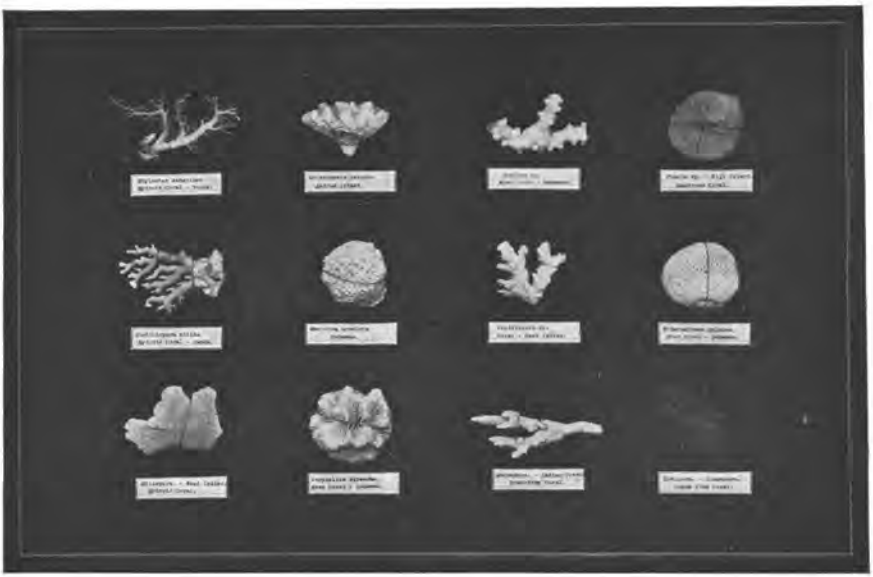
IM–570a

Order Zoantharia. Sea Anemones and Stony Corals

		Dry	Patent Jar	Museum Jar
IM–570.	**Metridium marginatum.** The common sea anemone		1.50	3.00
IM–570a.	**Metridium dissection.** One transverse and one longitudinal section with full descriptive label. See cut			6.00
IM–571.	**Sea Anemone,** Adamsia, growing on shell of hermit crab. A striking example of commensalism			5.00
IM–572.	**Cerianthus.** A sea anemone with long cylindrical body from the Mediterranean Sea		2.00	4.00
IM–573.	**Astrangia danae.** The northern coral with polyps expanded		2.00	4.00
IM–575.	**Madrepora.** The horn coral. A handsome specimen mounted on hardwood block	1.50		
IM–576.	**Diploria cerebriformis.** The Brain coral from Bermuda on hardwood block	1.50		
IM–577.	**Isophyllia dipsacea.** The rose coral on hardwood block	1.00		
IM–578.	**Fungia sp.** The mushroom coral on hardwood block	1.25		
IM–579.	**Pocillopora.** The many pored coral on hardwood block	1.25		

N.B.—List of over fifty species of recent stony corals furnished upon request.

IM–580.	**Collection** of 10 genera of coral mounted in special display case with labels. See cut, next page	12.00		



IM–580

Class Ctenophora (The Ctenophores)

		Dry	Patent Jar	Museum Jar
IM–590.	**Beroe ovata.** A large form from the Mediterranean		3.00	5.00
IM–591.	**Pleurobrachia,** a small perfect Ctenophore		1.00	
IM–592.	**Mnemiopsis leidyi.** A medium sized Ctenophore		2.00	

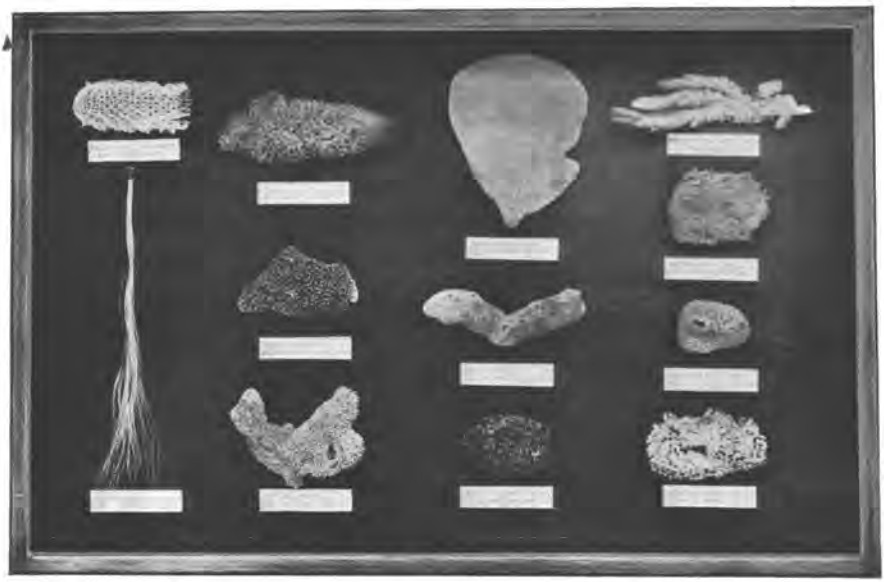
PORIFERA

Class Calcarea. Simple Sponges with Calcareous Spicules

IM–600.	**Grantia,** cluster mounted on glass		1.25
IM–601.	**Leucoselenia,** a small ascon sponge		1.00

Class Hexactinellida

IM–605.	**Euplectella oweni.** The beautiful Glass Sponge known as Venus' flower basket. On hardwood block	4.00–6.00
IM–606.	**Hyalonema.** The glass rope sponge, dry on hardwood base	5.00
IM–606a.	**The glass rope** only from Hyalonema in Riker mount	1.25



IM–625

Class Myxospongiae. Sponges without Skeleton

		Dry	Patent Jar	Museum Jar
IM–610.	**Oscarella** encrusting Mollusc shell	1.50		

Class Demospongiae. The Horny Sponges

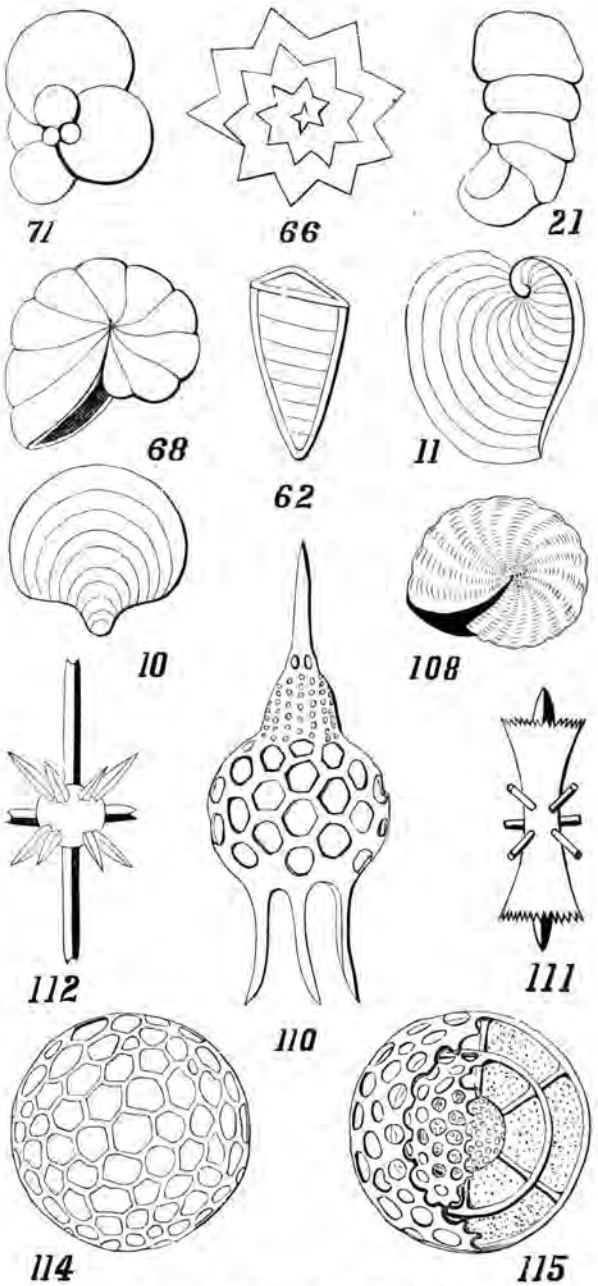
IM–615.	**Euspongia officinalis.** A section of a commercial sponge in uncleaned condition to show structure		2.00	4.00
IM–616.	**Cliona.** The Sulphur sponge		1.00	2.50
IM–617.	**Halichondria.** A Monaxonid sponge	.75		
IM–618.	**Suberites.** Sea cake	.50		
IM–619.	**Spongilla.** Fresh water sponge	1.25	1.00	3.00
IM–620.	**Tethya lyncurium.** Sugar loaf sponge		1.25	3.00
IM–621.	**Chalina.** Finger sponge		2.00	4.00
IM–622.	**Phyllospongia.** Paper sponge on wood block	1.25		
IM–625.	**Collection of 10 sponges** in special exhibition case with labels. See cut above	12.00		

N.B.—List of over 50 species of sponges furnished upon request.

PROTOZOA (ONE-CELLED ANIMALS)

IM–650.	**Collozoum inerme,** Mediterranean Sea		1.00
IM–651.	**Sphaerozoum punctatusm,** Mediterranean Sea		1.00
IM–652.	**Thalassicolla nucleata,** Mediterranean Sea		1.00
IM–655.	**Orbitolites complanatus,** several large foraminifera in glass top box	.75	

N.B.—See pages 134 and 137 for microscope slides of Protozoa.



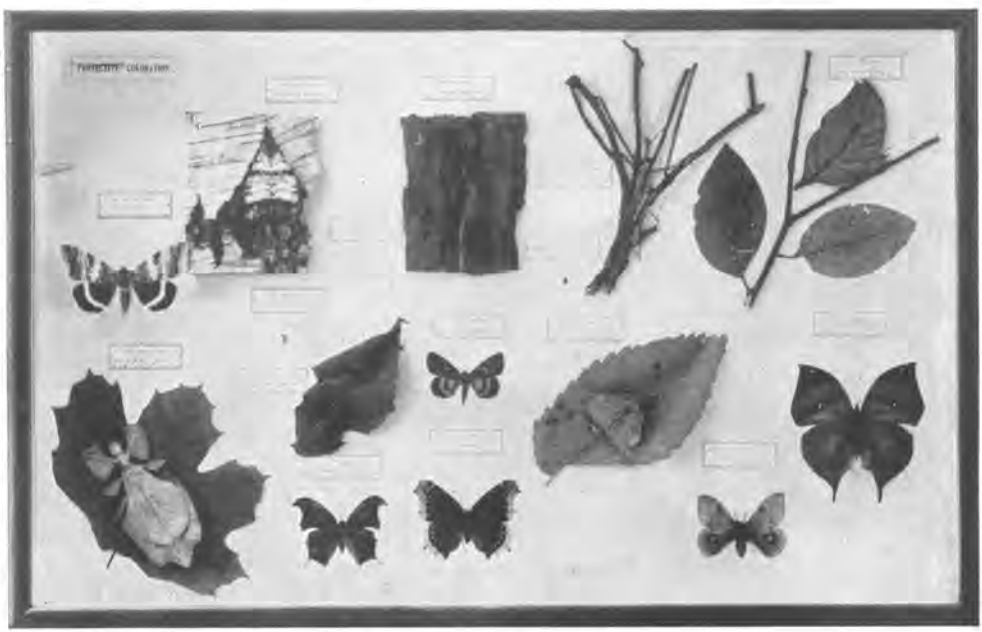
Foraminifera and Radiolaria

SECTION V. ENTOMOLOGY

A. MUSEUM PREPARATIONS OF INSECTS

INSECT COLLECTIONS

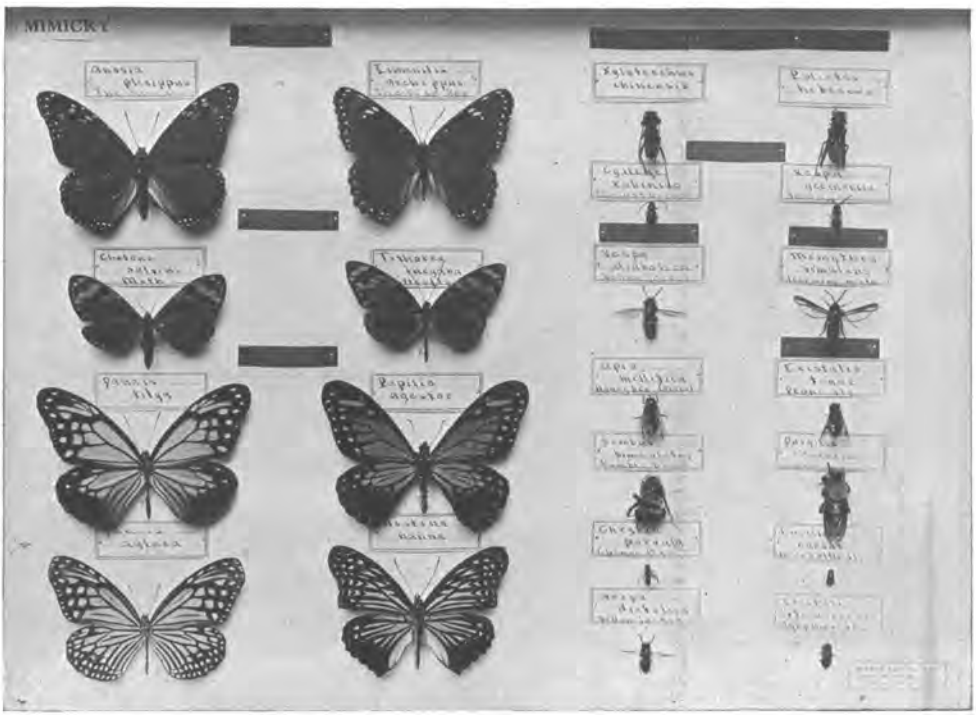
Collections Illustrating Color Protection



EC–2. Protective Coloration Collection.

		Price
EC–1.	**Protective Coloration Collection.** 10 American forms, 20 specimens in case 12″ x 16″	$12.00
EC–2.	**Protective Coloration Collection.** 8 American and 2 exotic forms (the Indian dead leaf butterfly and Walking leaf) represented by 20 insects in standard case 14″ x 22″	15.00
EC–3.	**Indian dead leaf butterfly** (Kallima inachis) one expanded specimen and one specimen showing protective coloration. In Riker Mount	3.00
EC–4.	**The mourning cloak butterfly** (Vanessa antiopa), 2 specimens in mount showing protective coloration	2.00
EC–5.	**The American dead leaf butterfly** (Grapta interrogationis), 2 specimens in mount showing protective coloration	2.00
EC–6.	**Walking stick from Florida** (Anisomorpha buprestoides), showing protective coloration, in mount	2.00
EC–7.	**Common walking stick** (Diapheromera femorata), showing protective coloration, in mount	1.50
EC–8.	**White ribbon underwing moth** (Catocala relicta), showing protective coloration, in mount	4.00
EC–9.	**Red ribbon underwing moth** (Catocala sp.), showing protective coloration, in mount	2.50

Collections Illustrating Mimicry



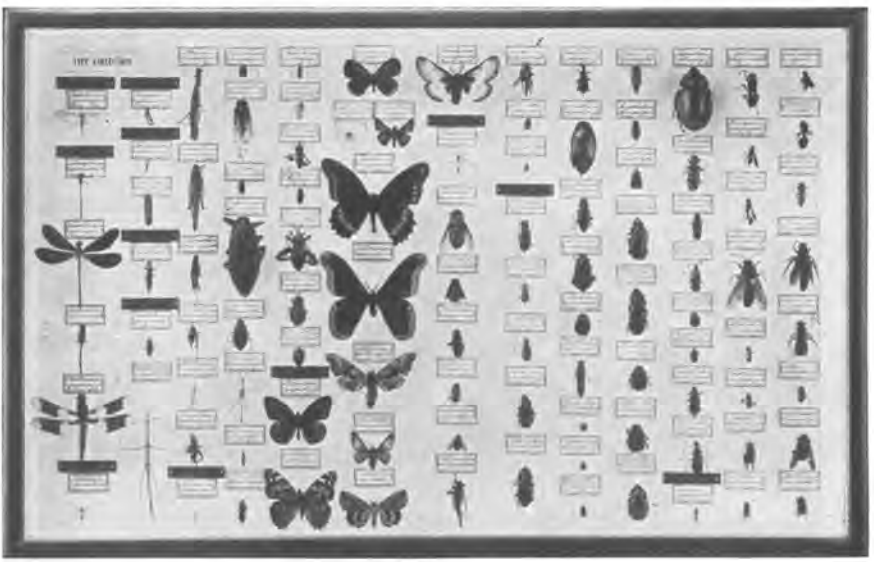
EM–1. Mimicry Collection

		Price
EM–1.	**Mimicry collection.** 10 American Forms represented by 20 insects in standard exhibition case 14″ x 22″	$12.00
EM–2.	**Mimicry collection.** Monarch and Viceroy Butterflies in Riker Mount; 6 specimens, male and female of each expanded; one specimen of each with wings folded	2.00
EM–3.	**Mimicry among the Hymenoptera.** Six insects which mimic bees, wasps, etc. 12 specimens in Riker mount	3.50

Insects Illustrating Warning Coloration

EW–1.	**Twelve brilliant exotic butterflies** in Wooden exhibition case, showing warning coloration	15.00
EW–2.	**Six brilliant exotic butterflies** in Riker mount, showing warning coloration	6.00
EW–3.	**Owl butterfly** (Caligo atreus), in Riker mount	3.00
EW–4.	**Cobra head moth** (Attacus atlas), in Riker mount	3.50
EW–5.	**The gorgeous** (Morpho cypris), in Riker mount	4.00
EW–6.	**The brilliant** (Morpho menelaus), in Riker mount	3.50
EW–7.	**The sunset fly** (Urania ripheus), in Riker mount	3.00
EW–8.	**The green banded butterfly** (Papilio blumei), in mount	3.50

Type or Systematic Collections of Insects of Boreal America



ET–2. Type Collection.

In preparing these collections great care has been taken to select specimens that will represent in the best manner the different orders and families. The collections are mounted in well made wooden exhibition cases with glass covers. The number of insects varies due to the size of the specimens selected, the cases being all well filled.

	Price
ET–1. 50–75 species in case 12″ x 16″	$12.00
ET–2. 75–100 species in case 14″ x 22″	18.00
ET–3. 125–150 species in case 18″ x 24″	25.00

For universities, colleges and museums we have prepared larger series in which the male and female of many of the species are included. The following orders are well represented: Lepidoptera, Coleoptera, Neuroptera, Odonata, Orthoptera, Hymenoptera, Diptera, Hemiptera, Trichoptera, and Plecoptera.

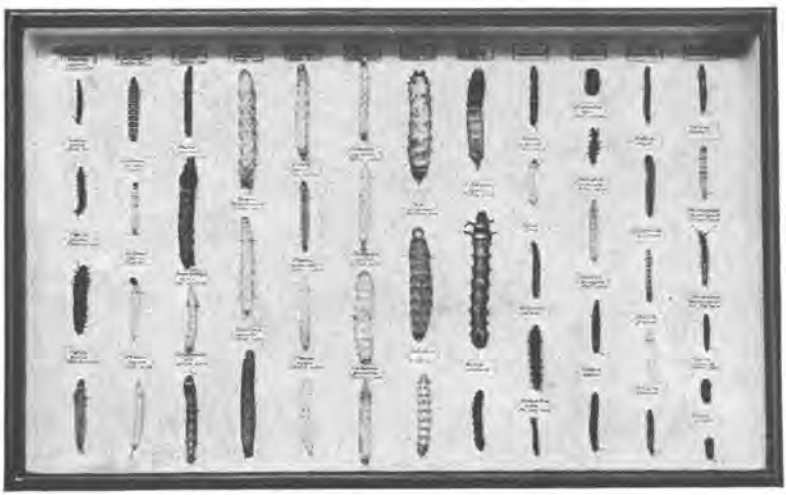
	Price
ET–4. 300 Insects in 10 exhibition cases 12″ x 16″	$ 80.00
ET–5. 500 Insects in 10 exhibition cases 14″ x 22″	150.00

N.B.—Still larger collections will be furnished if desired. Full particulars given upon request.

Synoptic Insect Collection

ES–1. A collection consisting of a single representative of each of ten orders, in Riker mount. Price $2.50

Collections of Inflated Larvae



EL–1. Inflated Larvae.

EL–1. Collection of the commoner and more striking larvae of butterflies and moths, as illustrated above. Each larva has been carefully inflated and should retain its present colors and form indefinitely. Price $30.00

EL–2. Collection of six large inflated larvae in Riker mount. Price $5.00

Collections of Insects of Economic Importance

In these collections are brought together the insects that are either of great value or a serious menace to this country. These collections are furnished in our standard exhibition cases. The labels give both the scientific and common names of the insects.

	Price
EE–1. 50 specimens of beneficial insects in case 12″ x 16″	$12.00
EE–2. 100 specimens of beneficial insects in case 14″ x 22″	18.00
EE–3. 50 specimens of injurious insects in case 12″ x 16″	12.00
EE–4. 100 specimens of injurious insects in case 14″ x 22″	18.00

Insect Galls Collection

EG–1. 12 specimens in exhibition case, labeled as to plant, insect causing gall, and common names. Price $6.00

Special Collections

EP–2. Garden Pests.

We have prepared five collections put up in our standard exhibition cases to illustrate the principal insect pests.

		Price
EP–1.	**Household pests,** 23 specimens	$12.00
EP–2.	**Garden pests,** 40 specimens	15.00
EP–3.	**Shade tree pests,** 24 specimens	12.00
EP–4.	**Forest tree pests,** 35 specimens	15.00
EP–5.	**Orchard pests,** 33 specimens	15.00

Sexual Dimorphism

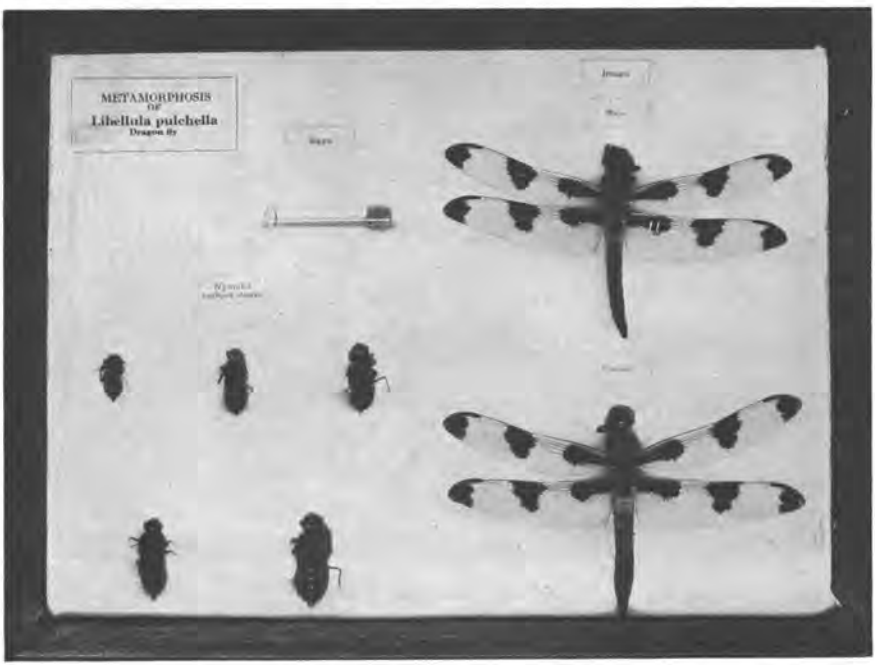
ED–1. A collection of North American and exotic forms beautifully arranged in a standard exhibition case 18″ x 24″, comprising the following specimens: Ornithoptera poseidon, Papilio memnon, gyas, alcinous, turnus, glaucus, Limenitis missippus, Argynnis niphe, Delias aruna, Orgyia leucostigma, Alsophila pometaria, Teinopalpis imperalis, Pieris mönuste, Cynthia erota, Anthocharis genutia, Colias philodice, Callosamia promethea, Hyperchiria io. Price $20.00

Exotic Beetle Collection

EB–1. We offer 10 of the largest exotic beetles in standard case 14″ x 22″, including Goliathus giganteus from Africa and some of the finest Lucanidae and Scarabiidae. Price $25.00

INSECT LIFE HISTORIES

Insects of Economic Importance



EH–14. Libellula Pulchella.

Orthoptera

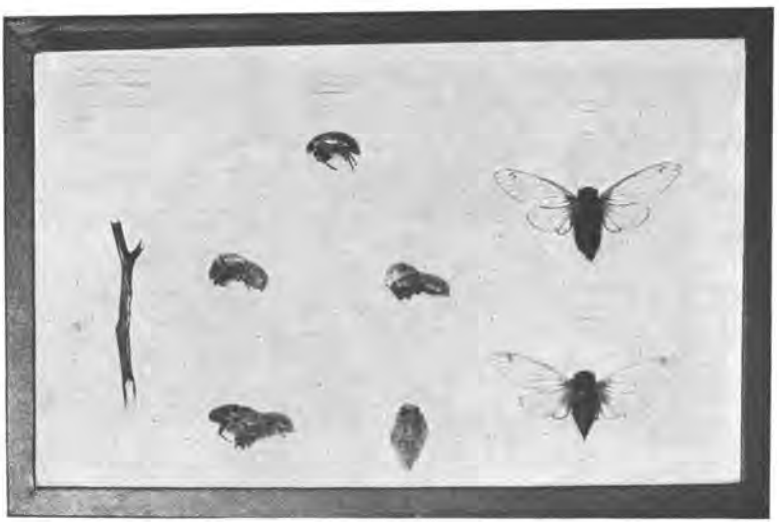
		In Riker Mount	In Pasteboard Exhibition Case	In Wooden Exhibition Case	In Museum Jar
EH–1.	**Blatta orientalis** (Oriental Roach)	2.50	3.00	3.50	
EH–2.	**Blattella germanica** (Croton Bug)	2.50	3.00	3.50	
EH–3.	**Diapheromera femorata** (Walking Stick)	2.50	3.00	3.50	6.00
EH–4.	**Dissosteria carolina** (Flying Dutchman) ..	2.50	3.00	3.50	6.00
EH–5.	**Gryllotalpa borealis** (Mole Cricket)	2.50	3.00	3.50	
EH–6.	**Gryllus domesticus** (House Cricket)	2.50	3.00	3.50	
EH–7.	**Gryllus abbreviatus** (Field Cricket)	2.50	3.00	3.50	6.00
EH–8.	**Mantis religiosa** (Praying mantis)	2.50	3.00	3.50	7.00
EH–9.	**Melanoplus femur-rubrum** (Red-legged Grasshopper)	2.00	2.75	3.25	6.00
EH–10.	**Oecanthus niveus** (Tree Cricket)	2.50	3.00	3.50	
EH–11.	**Periplaneta americana** (American Roach)	2.50	3.00	3.50	

Neuroptera

EH–12.	**Chrysopa occulata** (Lace-wing fly)	2.50	3.00	3.50	
EH–13.	**Platyphyla subfasciata** (Caddice Fly)	1.75	2.50	3.00	

Odonata

EH–14.	**Libellula pulchella** (Dragon Fly)	2.00	2.75	3.25	6.00



EH–17. Tibicen Spetendecim.

Homoptera

		In Riker Mount	In Pasteboard Exhibition Case	In Wooden Exhibition Case	In Museum Jar
EH–15.	**Ceresa bubalis** (Buffalo Tree-hopper) ...	2.00	2.75	3.75	
EH–16.	**Cicada tibicen** (Dog-day Harvest-fly)	2.50	3.00	3.50	7.00
EH–17.	**Tibicen septendecim** (17-year Locust) ...	2.75	3.25	3.75	8.00

Hemiptera

EH–18.	**Anasa tristis** (Squash Bug)	2.50	3.00	3.50	6.00
EH–19.	**Lygus pratensis** (Tarnished plant bug)	2.00	2.75	3.25	
EH–20.	**Murgantia histrionica** (Harlequin Cabbage Bug)	1.75	2.50	3.00	

Coleoptera

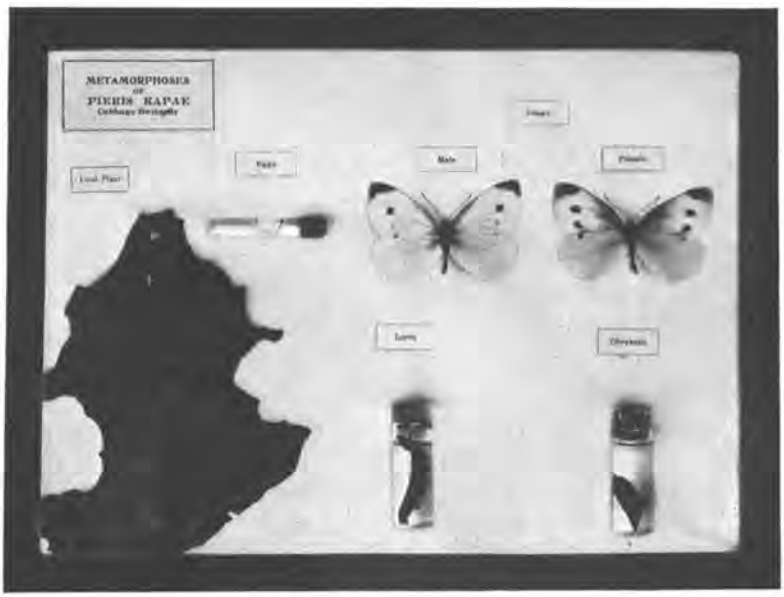
EH–21.	**Adalia bipunctata** (Lady-bug)	1.75	2.50	3.00	5.00
EH–22.	**Agrilus anxius** (Bronze Birch Borer) ...	2.50	3.00	3.50	
EH–23.	**Agrilus ruficollis** (Red-necked Agrilus) ..	2.50	3.00	3.50	
EH–24.	**Anatis 15-punctata** (Lady Bug)	1.75	2.50	3.00	
EH–25.	**Anthonomus grandis** (Boll Weevil)	2.50	3.00	3.50	5.00
EH–26.	**Anthonomus pomorum** (Apple bud Weevil)	2.50	3.00	3.50	
EH–27.	**Anthrenus scrophulariae** (Carpet Beetle)	1.75	2.50	3.00	

Coleoptera (Continued)

		In Riker Mount	In Pasteboard Exhibition Case	In Wooden Exhibition Case	In Museum Jar
EH–28.	**Balaninus caryatrypes** (Chestnut Weevil)	2.50	3.00	3.50	
EH–29.	**Bruchus pisorum** (Pea Weevil)	2.50	3.00	3.50	
EH–30.	**Cassida bivittata** (Sweet-potato Beetle)	1.75	2.50	3.00	
EH–31.	**Chrysobothris femorata** (Flat-headed Apple-borer)	2.50	3.00	3.50	
EH–32.	**Conotrachelus nenuphar** (Plum Curculio)	2.50	3.00	3.50	5.00
EH–33.	**Coptocycla bicolor** (Sweet-potato Beetle)	1.75	2.50	3.00	
EH–34.	**Crioceris asparagi** (Common Asparagus Beetle)	2.50	3.00	3.50	
EH–35.	**Crioceris 12-punctata** (Spotted Asparagus Beetle)	2.50	3.00	3.50	
EH–36.	**Diabrotica 12-punctata** (Spotted Cucumber Beetle)	2.00	2.75	3.25	
EH–37.	**Diabrotica vittata** (Striped Cucumber Beetle)	2.00	2.75	3.25	
EH–38.	**Dermestes lardarius** (Larder Beetle)	1.75	2.50	3.00	
EH–39.	**Epilachna corrupta** (Mexican Bean Beetle)	2.00	2.75	3.25	
EH–40.	**Gallerucella luteola** (Elm leaf Beetle)	1.75	2.50	3.00	5.00
EH–41.	**Lachnosterna species** (May and June Beetles)	2.50	3.00	3.50	
EH–42.	**Lasioderma serricorne** (Tobacco Beetle)	1.75	2.50	3.00	
EH–43.	**Lena scripta** (Willow Beetle)	1.75	2.50	3.00	
EH–44.	**Leptinotarsa 10-lineata** (Potato Beetle)	1.75	2.50	3.00	5.00
EH–45.	**Passalus cornutus** (Horned Passalus)	2.50	3.00	3.50	6.00
EH–46.	**Parandra brunnea** (Ailanthus Beetle)	2.50	3.00	3.50	6.00
EH–47.	**Pelidnota punctata** (Spotted Pelidnota)	2.50	3.00	3.50	6.00
EH–48.	**Popillia japonica** (Japanese Beetle)	2.25	3.00	3.50	
EH–49.	**Scolytus rugulosus** (Fruit-bark Beetle)	2.50	3.00	3.50	
EH–50.	**Scolytus 4-spinosus** (Hickory-bark Beetle)	2.50	3.00	3.50	
EH–51.	**Silvanus surinamensis** (Grain Beetle)	1.75	2.50	3.00	
EH–52.	**Sphenophorus sculptilis** (Corn Bill Bug)	1.75	2.50	3.00	
EH–53.	**Tenebrio molitor** (Meal Worm)	2.50	3.00	3.50	5.00

Lepidoptera

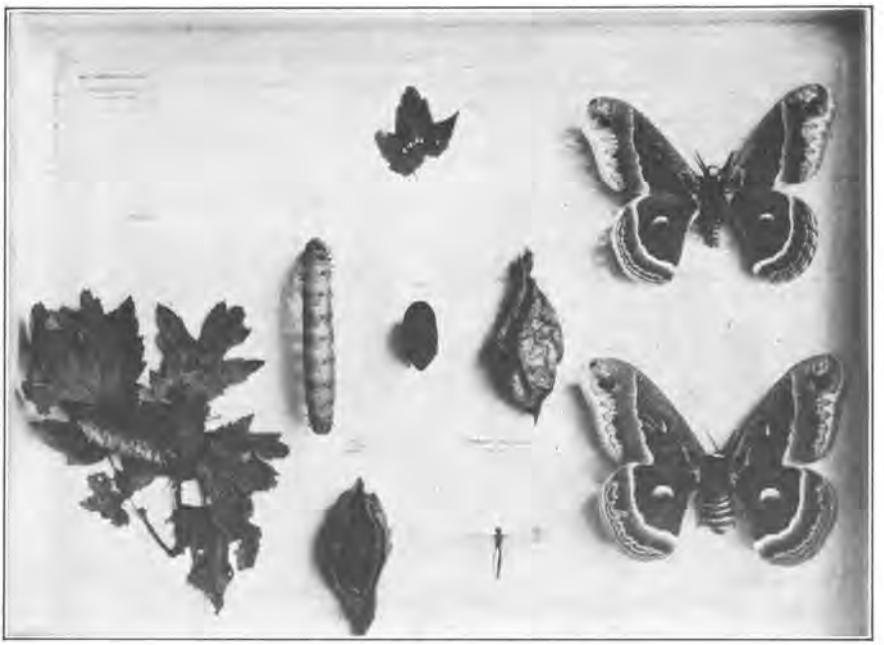
		In Riker Mount	In Pasteboard Exhibition Case	In Wooden Exhibition Case
EH–54.	**Agrotis ypsilon** (Cut-worm)	1.75	2.50	3.00
EH–55.	**Alsophila pometaria** (Fall Canker Worm)	2.50	3.00	3.50
EH–56.	**Cacaecia cerasivorana** (Cherry-tree ugly nest tortricid)	1.75	2.50	3.00
EH–57.	**Carpocapsa pomonella** (Codling Moth)	2.50	3.00	3.50
EH–58.	**Clisiocampa americana** (Apple Tent Caterpillar)	2.50	3.00	3.50
EH–59.	**Clisiocampa americana** (Apple Tent Caterpillar with tent)	3.00	3.50	4.00
EH–60.	**Clisiocampa distria** (Forest Tent Caterpillar)	2.50	3.00	3.50
EH–61.	**Ephestia keuhniella** (Med. Flour Moth)	2.00	2.75	3.25
EH–62.	**Euproctis chrysorrhoea** (Brown Tail Moth	2.50	3.00	3.50
EH–63.	**Feltia herilis** (Cut worm)	1.75	2.50	3.00
EH–64.	**Feltia jaculifera** (Cut-worm)	1.75	2.50	3.00
EH–65.	**Feltia subgothica** (Cut-worm)	1.75	2.50	3.00
EH–66.	**Galleria melonella** (Bee Moth)	2.50	3.00	3.50
EH–67.	**Harrisinia americana** (On Grape)	1.75	2.50	3.00
EH–68.	**Heliothis armigera** (Corn Ear Worm)	2.50	3.00	3.50



EH–78. Pieris Rapae.

Lepidoptera (Continued)

		In Riker Mount	In Pasteboard Exhibition Case	In Wooden Exhibition Case
EH–69.	**Hyphantria cunea** (Fall Web Worm)	1.75	2.50	3.00
EH–70.	**Hyphantria cunea** (Fall Web Worm with web)	2.50	3.00	3.50
EH–71.	**Leucania unipuncta** (Army Worm)	1.75	2.50	3.00
EH–72.	**Melitia satiriniformis** (Squash-vine Borer)	2.50	3.00	3.50
EH–73.	**Noctua c-nigrum** (Cut-worm)	1.75	2.50	3.00
EH–74.	**Orgyia leucostigma** (Tussock Moth)	1.75	2.50	3.00
EH–75.	**Peridroma saucia** (Cut-worm)	1.75	2.50	3.00
EH–76.	**Phlegethontius carolina** (Tomato Moth)	2.75	3.25	3.75
EH–77.	**Phlegethontius celeus** (Tobacco Moth)	2.75	3.25	3.75
EH–78.	**Pieris rapae** (Cabbage Butterfly)	1.75	2.50	3.00
EH–79.	**Plodia interpunctella** (Grain Moth)	1.75	2.50	3.00
EH–80.	**Porthetria dispar** (Gypsy Moth)	2.50	3.00	3.50
EH–81.	**Pyrausta nubialis** (European corn borer)	2.00	2.75	3.25
EH–82.	**Recurvaria manella** (The Lesser Budmoth)	2.00	2.75	3.25
EH–83.	**Sanina exitosa** (Peach Borer)	2.50	3.00	3.50
EH–84.	**Sericaria mori** (Silk Worm)	2.50	3.00	3.50
EH–85.	**Sericaria mori** (Silk Worm with raw and spun silk)	3.00	3.50	4.00
EH–86.	**Sitotroga cerealella** (Pop-corn moth)	2.00	2.75	3.25
EH–87.	**Thyridopteryx ephemeraeformis** (Bagworm)	2.50	3.00	3.50
EH–88.	**Tineola biselliella** (Cloth Moth)	1.75	2.50	3.00
EH–89.	**Tmetocera occelana** (Bud Moth)	2.50	3.00	3.50
EH–90.	**Zeuzera pyrina** (Leopard Moth)	2.50	3.00	3.50
EH–91.	**Zeuzera pyrina** (Leopard Moth, elaborate with borings)	3.00	3.50	4.00



EH–121. Samia Cecropia.

Diptera

		In Riker Mount	In Pasteboard Exhibition Case	In Wooden Exhibition Case	In Museum Jar
EH–92.	**Calliphora vomitoria** (Blow Fly)	1.75	2.50	3.00	5.00
EH–93.	**Lucilia caesar** (Blue Bottle Fly)	1.75	2.50	3.00	
EH–94.	**Musca domestica** (House Fly)	1.75	2.50	3.00	5.00
EH–95.	**Phorbia brassicae** (Cabbage Maggot) ...	2.50	3.00	3.50	
EH–96.	**Rhagoletis pomonella** (Apple Maggot) ..	2.50	3.00	3.50	
EH–97.	**Sarcophaga carnaria** (Flesh Fly)	1.75	2.50	3.00	
EH–98.	**Stomoxys calcitrans** (Stable Fly)	1.75	2.50	3.00	6.00

Hymenoptera

EH–99.	**Apis mellifica** (Honey Bee)	3.00	3.50	4.00	7.00
EH–100.	**Apis mellifica** (Honey Bee, with queens, including Life History Bee Moth and different cells complete)	4.00	4.50	5.00	
EH–101.	**Bombus ternarius** (Ground Bumble Bee)	2.50	3.00	3.50	
EH–102.	**Bombus ternarius** (Ground Bumble Bee with nest)	3.00	3.50	4.00	
EH–103.	**Callirhytis punctata** (Oak Gall Wasp) ..	1.75	2.50	3.00	
EH–104.	**Camponotus pennsylvanicus** (Carpenter Ant)	2.50	3.00	3.50	
EH–105.	**Cimbex americana** (Willow Saw Fly) ..	2.50	3.00	3.50	
EH–106.	**Cimbex americana** (Willow Saw Fly with Life History of Parasite)	3.00	3.50	4.00	
EH–107.	**Polistes metricus** (Paper Wasp)	1.75	2.50	3.00	
EH–108.	**Vespa crabro** (Hornet)	2.50	3.00	3.50	
EH–109.	**Vespa diabolica** (Yellow-jacket)	1.75	2.50	3.00	6.00
EH–110.	**Vespa germanica** (Yellow-jacket)	1.75	2.50	3.00	
EH–111.	**Vespa maculata** (White-faced Hornet) ..	1.75	2.50	3.00	6.00

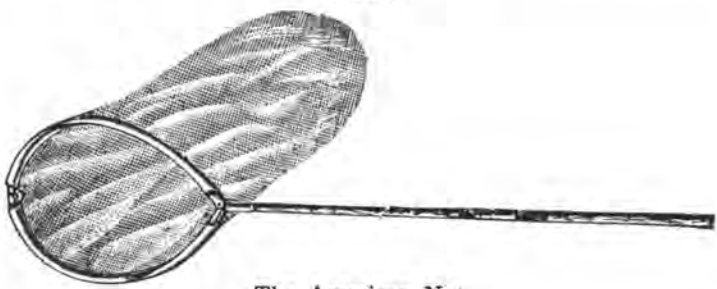
ES–14. Situs Dissection of Belostoma. Price $5.50.

Life Histories of Common Moths & Butterflies

		In Riker Mount	In Pasteboard Exhibition Case	In Wooden Exhibition Case
EH–112.	**Actias luna** (Luna Moth)	3.50		5.50
EH–113.	**Anosia plexippus** (The Monarch)	2.00	2.75	3.25
EH–114.	**Callosamia promethea**	3.00		5.00
EH–115.	**Hyperchiria io** (Io moth)	3.00		5.00
EH–116.	**Papilio ajax**	3.00	3.50	4.00
EH–117.	**Papilio asterias**	2.50	3.00	3.50
EH–118.	**Papilio troilus**	2.50	3.00	3.50
EH–119.	**Papilio turnus** (Tiger Swallowtail)	2.50	3.00	3.50
EH–120.	**Philosamia cynthia**	3.00		5.00
EH–121.	**Samia cecropia** (Cecropia Moth)	3.00		5.00
EH–122.	**Telea polyphemus** (Polyphemus Moth)	3.00		5.00
EH–123.	**Vanessa antiopa** (Mourning Cloak)	2.00	2.75	3.25

B. ENTOMOLOGICAL SUPPLIES, MICROSCOPES, & DISSECTING INSTRUMENTS

NETS



The American Net

The American Net, 15″ diameter. This net ring is made of flat steel spring stock enameled, folding flat in two parts; very light and strong.

ES–110. Net ring with 2-folding stick (without bag), $2.75. Postage extra.

ES–110a. Bruxelle bag for American net, 85c. Postage extra.

ES–110b. Dredging bag for American net, 85c. Postage extra.

ES–110c. Canvas beating bag for American net, 85c. Postage extra.

ES–110d. Imported silk bag for American net, $3.50. Postage extra.

ES–110s. Extra fine Bruxelle bag for American net, $1.25. Postage extra.

ES–604. **American Midget Net.** Diameter 10 in.; short bamboo stick, 12 in. long; net frame and stick only, $2.00. Postage extra.

ES–605. The same with brussels bag, $2.65. Postage extra.

ES–606. The same with fine brussels bag, $2.75. Postage extra.

ES–607. The same with beating or water bag, $2.80. Postage extra.

Standard Nets, 12″ diameter

ES–100. Standard plain ring, 12″ diameter, with gauze bag, 75c. Postage extra.

ES–100a. Standard ring, brass stick holder, with Bruxelle bag, 80c. Postage extra.

ES–100b. Standard ring, brass stick holder, with canvas bag, $1.00 Postage extra.

ES–100c. Standard ring, brass stick holder, with dredging bag, $1.00. Postage extra.

ES–100d. Plain stick for Standard nets, 15c. Postage extra.

ES–100e. Bamboo stick for Standard nets, 20c. Postage extra.

ES–100f. 3-folding bamboo stick for Standard nets, $1.00. Postage extra.

The Featherweight Net has the ring made of cane instead of wire and has a twisted cane stick. This is especially recommended for women and children on account of its extreme lightness.

ES–119. Frame and stick, without bag, 75c. Postage extra.

ES–119a. Gauze bag for above, 50c. Postage extra.

ES–119b. Fine Bruxelle bag for above, 75c. Postage extra.

ES–119c. Imported Swiss silk bag for above, $3.00. Postage extra.

ES–112. The Hood Aquatic Net.

The Hood Insect Net

We are offering this net for the first time and it is our firm belief that in the near future the Hood net will be accepted as standard throughout the country.

The construction is very simple and the net-frame is practically indestructible, there being no soldered parts, no bolts, nuts, or screws to work loose. The bent ends of the hoop fit into a grooved handle and are held in place by a ferrule, which is easily removed, permitting a quick change of bags.

This net is regularly supplied in the two standard sizes; 12″ and 15″ hoops, and with a variety of bags. Special sizes will be furnished on application.

ES–111. Handle & ferrule, 25c.

ES–111a. 12″ ring, 50c.

ES–111b. 15″ ring, 60c.

Bags for above

ES–111c. Gauze bag, 12″, 50c. 15″, 60c.

ES–137. New Bruxelle bag, 12″, 75c. 15″, 85c.

ES–139. Canvas bag, 12″, 80c. 15″, 85c.

ES–141. Crash bag, 12″, 80c. 15″, 85c.

ES–143. Imported Swiss silk bag, 12″, $3.00. 15″, $3.50.

The Hood Aquatic Net

In construction this water net is very similar to the Hood insect net. However instead of the ring fitting into the grooved stick, it fits into an aluminum plug. This plug in turn fits into a slotted ferrule that is attached to the wooden handle and is held firmly in place by means of a bayonet catch. With this construction there can be no great tightening up of the parts due to swelling of the wooden handle in the water, and the ring may easily be removed for a change of bag or size of hoop. All parts are made of rustproof metal.

ES–112. Net frame complete, without bag, $2.50.

N.B.—Any of the bags listed above fit this net.

INSECT PINS

The American Entomological Co.'s insect pins, which are now manufactured by us exclusively, are too well known to need any further description. They are the standard for the entomologists of this country, and have gradually made their way into the other continents as well.

No. ES–210 and ES–211 are our regular standard 37mm., and recommended for all countries.

ES–201. The Klaeger special patent black japanned steel pin, sizes 000 to 7, put up in packages of 100 or 500 of a size.

Nos. 1-7, in packages of 100 of a size, per 1000, $2.50. Postage extra.
Nos. 000-0, in packages of 100 of a size, per 1000, $3.00. Postage extra.
Nos. 1-7, in packages of 100 of a size, per 100, 30c. Postage extra.
Nos. 000-0, in packages of 100 of a size, per 100, 32c. Postage extra.

ES–206. Stretching or spreading needles, with screw handle, each, 20c. Postage extra.

ES–207. Spreading Pins, per box of 800, 75c. Postage extra.

ES–209. Label pins, domestic, per 1000, 20c. Postage extra. Per 10,000, $1.75. Postage extra.

ES–210. A. E. Co. special double japanned black steel pins, made of finely tempered steel. They have needle points and absolutely fast heads; made in sizes from No. 00 to 7, and put up in packages of 100 or 500 of a size, **guaranteed.**

1-7 in packages of 500, $3.00 per 1000. Postage extra.
00-0 in packages of 500, $3.75 per 1000. Postage extra.
1-7 in packages of 100, $ .36 per 100. Postage extra.
00-0 in packages of 100, $ .42 per 100. Postage extra.

ES–211. A. E. Co. special double plated white steel pins. These pins are as perfect as a pin can be made and we guarantee them as to quality and construction. Made in sizes from Nos. 00 to 7, and put up in packages of 100 or 500 of a size.

1-7 in packages of 500, $3.15 per 1000. Postage extra.
0-00 in packages of 500, $3.90 per 1000. Postage extra.
1-7 in packages of 100, $ .38 per 100. Postage extra.
0-00 in packages of 100, $ .44 per 100. Postage extra.

ES–216. Our special double japanned, tempered steel Minuten Nadeln, polished, sharp points. We recommend it as the best on the market. Sent on trial. Money refunded if not found satisfactory. Far superior to any other make. Per 1000, $3.00. Postage extra.

ES–216½. Special large white pins No. 20, per 1000, $3.75. Postage extra.

BOTANICAL PRESSES

ES–661. Riker botanical press, 9 x 12 inches. $2.00.
ES–661. Riker botanical press, 12 x 19 inches. $3.25.

BOTANICAL VASCULUM

ES–251. Botanical Vasculum or Collecting Case, of metal, enameled, with door opening along entire length. Size 130 x 200 x 400 mm. $3.00. Postage extra.

KILLING BOTTLES AND SHELL VIALS

ES–226. Shell vials for preserving alcoholic specimens, with corks.

Height inches	1	1¼	1⅝	2	2½	2	3	3½	4
Diameter inches	½	5/16	5/16	½	¾	⅞	⅞	1	½
Price per 10	.30	.30	.30	.30	.35	.60	.60	.70	.60

N.B.—In ordering vials specify height and diameter desired.

ES–227. Glass jar, one ounce, clear white glass, aluminum screw top cork lined, height 4 in., diameter of mouth ⅝ in. Price 12c each; $1.25 per dozen. Postage extra.

ES–228. 2-oz. jar, height 3¾ in., diameter 1 7/16 in. Price 15c each; $1.50 per dozen. Postage extra.

ES–229. 4-oz. jar, height 4¾ in., diameter 1⅝ in. Price 18c each; $1.80 per dozen. Postage extra.

ES–230. 8-oz. jar, height 4⅞ in., diameter 2 7/16 in. Price 25c each; $2.50 per dozen. Postage extra.

ES–231. 16-oz. jar, height 5¾ in., diameter 3½ in. Price 30c each; $3.00 per dozen. Postage extra.

ES–232. Corks for fitting above bottles:

Size of bottle	1 oz.	2 oz.	4 oz.	8 oz.	16 oz.
Price of cork	.05	.10	.15	.25	.30

N.B.—All glass ware is packed with the greatest care, but the price does not include postage.

ES–233. 1 ounce bottle charged with cyanide, ready for use, both screw top and cork stopper with each bottle. 30c. Express extra.

ES–234. 2 ounce bottle, as above. 40c. Express extra.

ES–235. 4 ounce bottle, as above. 50c. Express extra.

ES–236. 8 ounce bottle, as above. 60c. Express extra.

ES–237. 16 ounce bottle, as above. 75c. Express extra.

ES–238. A strong white glass bottle, with cork stopper, height 5¼ inches, diameter 2⅝ inches, charged with cyanide, and ready for use. 60c. Express extra. (A good bottle for killing most insects of Boreal America.)

ES–240. Extra large glass jar with glass stopper, 10½ inches high, 4 inches wide. $2.25. Not mailable.

ES–241. Extra large glass jar as above charged. $3.00. Not mailable.

CORK

We carry an excellent quality of cork manufactured especially for us. It is furnished in bundles of 24 sheets of a size.

XXX or A quality cork:

Code No.	ES–292	ES–293	ES–294	ES–295	ES–296	ES–297
Length, inches	12	12	12	12	12	12
Breadth, inches	3½	4	3½	4	3½	4
Thickness, inches	⅛	⅛	3/16	3/16	¼	¼
Price per bundle of 24 sheets	$4.60	$5.35	$6.80	$8.05	$9.10	$10.65

XX or B quality cork:

Code No.	ES–298	ES–299	ES–300	ES–301	ES–302	ES–303
Length, inches	12	12	12	12	12	12
Breadth, inches	3½	4	3½	4	3½	4
Thickness, inches	⅛	⅛	3/16	3/16	¼	¼
Price per bundle of 24 sheets	$3.05	$3.55	$4.55	$5.35	$6.05	$7.10

X or C quality cork:

Code No.	ES–304	ES–305	ES–306	ES–307	ES–308	ES–309
Length, inches	12	12	12	12	12	12
Breadth, inches	3½	4	3½	4	3½	4
Thickness, inches	⅛	⅛	3/16	3/16	¼	¼
Price per bundle of 24 sheets	$2.05	$2.50	$3.05	$3.60	$4.05	$4.75

BREEDING CAGES

The frames of these cages are made of strong carefully selected wood, the sides and top being of a very fine, noncorroding wire gauze. They are made collapsible, so can be taken apart and made into a small package. They are recommended by the most experienced entomologists.

ES–275. Cage, 12 x 8 x 10 inches. Price, $3.25. Postage extra.

ES–276. Cage, 15 x 10 x 14 inches. Price, $3.75. Postage extra.

ES–277. Cage, 10 x 12 x 12 inches. Price, $4.25. Postage extra.

ES–278. Cage, 20 x 15 x 15 inches. Price, $5.25. Postage extra.

ES–279. Cage, 24 x 18 x 18 inches. Price, $5.75. Postage extra.

ES–280. Cage, 20 x 24 x 20 inches. Price, $8.00. Postage extra.

ES–277. Folding Breeding Cage.

The interior of above cages can be partitioned if desired. Zinc boxes to insert in base, price on application. Postage extra.

INSECT TRAP

The trap consists of three chambers, the attraction chamber, the killing chamber, and the chamber with the light. These chambers are separated by glass partitions. The trap is 24 inches long x 10 inches high, and has a detachable cover. With it there are provided poison jar, lamp and reflector. The whole is collapsible, so that it can be conveniently and easily packed in any trunk.

ES–281. Complete as above, $10.00.

PATENT ENTOMOLOGICAL CORK

This is the finest prepared material for entomological work ever put on the market. It is perfectly smooth and of uniform thickness and texture throughout; covered on both sides with white glazed paper.

ES–315. Patent entomological cork, $\frac{3}{16}$" thick:

Length, inches	5⅝	7⅜	11⅜	11⅜	17½	17¾	23	23⅜	29⅝	35
Breadth, inches	3⅜	5⅝	7⅜	11½	11½	17½	17½	23	23	23
Price per sheet	$.15	.24	.45	.65	1.00	1.55	1.90	2.60	3.50	3.75

Special offer. Pieces 2½ x 7 inches $.05 each.

BALSA WOOD

ES–321. As Torf or Peat Plates are no longer obtainable, we can offer as an excellent substitute imported Balsa Wood.

Size 4 in. x 12 in. x ¼ in. 15c. Size 4 in. x 24 in. x ¼ in. 30c. Postage extra.

INSECT BOXES

SCHMITT INSECT BOXES

The only genuine Schmitt Box is made in our factory. For years these boxes were made by the designer, who finally sold his plant to the American Entomological Co., and they with the men formerly employed by Mr. Schmitt, continued the same careful hand construction. When we purchased the business of the American Entomological Co. we brought to Rochester the foreman of the box factory, and he is still personally supervising every Schmitt box turned out by us. **Do not accept other so-called Schmitt boxes.** These are the only genuine ones on the market.

The box is made of white pine, varnished and rubbed to a high finish. Both bottom and top are made of three-ply wood, and the hinged cover is very carefully fitted, so as to make the box dust and insect proof. It is cork lined.

These boxes are used by the U. S. Government and by most of the Experimental Stations of the country.

ES–475

ES–475. No. 2 Schmitt Box, 9 x 13 in., plain edge, varnished, and lined with pressed cork. Price $2.25; per dozen $26.00.

ES–475A. No. 2 Schmitt Box as above, but lined with patent cork. Price $2.50; per doz. $29.00.

ES–476. No. 3 Schmitt Box, 8½ x 13 in., protruding edge, varnished, and lined with pressed cork. Price $2.50, per dozen $29.00.

ES–476A. No. 3 Schmitt Box, as above, but lined with patent cork. Price $2.90; per dozen $34.00.

ES–477. No. 4 Schmitt Box, 12 x 15 in., plain edge, varnished, and lined with pressed cork. Price $3.25; per dozen $38.00.

ES–477A. No. 4 Schmitt Box, 12 x 15 in., plain edge, varnished, and lined with patent cork. Price $3.75; per dozen $44.00.

THE ROCHESTER BOX

This is a new box put on the market for the first time, to fill the need for a first class box somewhat cheaper than the Schmitt Box.

In construction the Rochester Box is very similar to the Schmitt box. However the corners are made by the dovetail method and the box is finished in a dark brown stain. The top and bottom of the box are made of fir lumber instead of basswood. The box is the same depth as the Schmitt box but is only 8 x 12". We can supply Schmitt cabinets to hold this box.

Each $1.75 Dozen $20.00

PASTEBOARD INSECT BOXES

The Aero Box. The best and tightest pasteboard box on the market. Made of very heavy cardboard with tight-fitting hinged cover; bound in dark brown pebbled paper. Size 10 x 12 inches; lined with cork covered with white glazed paper.

ES–460a. Aero box, lined with pressed cork, 75c each; $8.75 per doz.

Duplicate Box of heavy pasteboard, with overlapping hinged cover; lined with pressed cork covered with white glazed paper. Size 10 x 12 inches.

ES–461a. Duplicate Box, cork lined. Price 60c each; $7.00 per doz.

THE HOOD INSECT BOX

This box was designed by Professor J. Douglas Hood of the University of Rochester and was used extensively as a container for many of the insects collected by the Cornell-Rochester Entomological Expedition through Western United States in the summer of 1927. Specimens were carried in HOOD BOXES for a distance of 5,000 miles over many of the poorest roads in the country. Often times the boxes were merely tossed into the tonneau of the automobile and other luggage piled on top, and yet the specimens came through in perfect condition.

The HOOD BOX is 8¾" x 12¾" x 2¾", outside dimensions. The pinning bottom is a wood pulp composition; an excellent substitute for cork. The box is lined throughout with white glazed paper and the outer covering is a heavy black watergrain paper. The frame of both box and cover is made from three-ply veneer with interlocked corners which enables us to make a tight fitting cover which is pestproof to an extent which is impossible when only cardboard is used. In all respects the HOOD BOX is of quality construction, very different from other low-price boxes now on the market.

ES–462. $1.25 each $12.00 per doz. $90.00 per C ES–462

INSECT CABINETS

Special thought and care have been given to the construction of our cabinets, and we believe the result has justified the labor.

Each drawer is cork lined and is built with a glass cover accurately fitted and held in place by tongue and groove so as to give complete protection against dust and dermestes. Our standard cabinets, unless otherwise stated, are made of well seasoned dry lumber stained to imitate oak or cherry. Finished with varnish and rubbed down to a high polish. These are hand made cabinets with every part carefully fitted.

Cabinets of special size and special woods will be made to order.

ES–504. 12-drawer cabinet. 12 drawers in a single row, every drawer 18 x 23 in., lined with pressed cork; drawers equipped with button pullers. Price $125.00.

ES–506. 12-drawer cabinet as above, but provided with door covering drawers, $140.00.

N. B.—Any of the above 12-drawer cabinet drawers equipped with patent or flush pullers, $12.00 extra.

Any of the above 12-drawer cabinet drawers, lined with patent entomological cork, $20.00 extra.

ES–512. 20-drawer cabinet. Two rows of ten drawers, 18 x 23 in. Drawers lined with pressed cork and equipped with button pullers. Price $225.00.

ES–514. 20-drawer cabinet as above, equipped with outside doors. Price $250.00.

ES–504

N. B.—Any of the above 20-drawer cabinet drawers equipped with patent or flush pullers, $25.00 extra.

Any of the above 20-drawer cabinet drawers lined with patent entomological cork, $35.00 extra.

ES–520. 30-drawer cabinet. Two rows of 15 drawers, 18 x 23 in. Drawers lined with pressed cork and equipped with button pullers. Price $300.00.

ES–522. 30-drawer cabinet as above, equipped with outside doors. Price $350.00.

N. B.—Any of the above 30-drawer cabinet drawers equipped with patent or flush pullers, $30.00 extra.

Any of the above 30-drawer cabinet drawers lined with patent entomological cork, $50.00 extra.

Packing of cabinets will be charged at cost.

N. B.—Prices given upon request for solid hard wood cabinets or those made of veneer.

THE SCHMITT CABINET

ES–480. This cabinet is designed to fill a long-felt need for a receptacle for our famous Schmitt boxes. The standard size is the one illustrated, which holds 56 boxes, and ES–481 the half-size holds 28 boxes. These are stocked for our No. 2 and No. 3 boxes but will be made to hold any box desired. Smaller or larger sizes will also be made upon request.

ES–480. (Full size, holds 56 boxes) $75.00.

ES–481. (Half size, holds 28 boxes) $45.00.

N.B.—These cabinets will be supplied to hold our Standard Exhibition cases. Prices on request.

EXHIBITION CASES

STANDARD EXHIBITION CASES

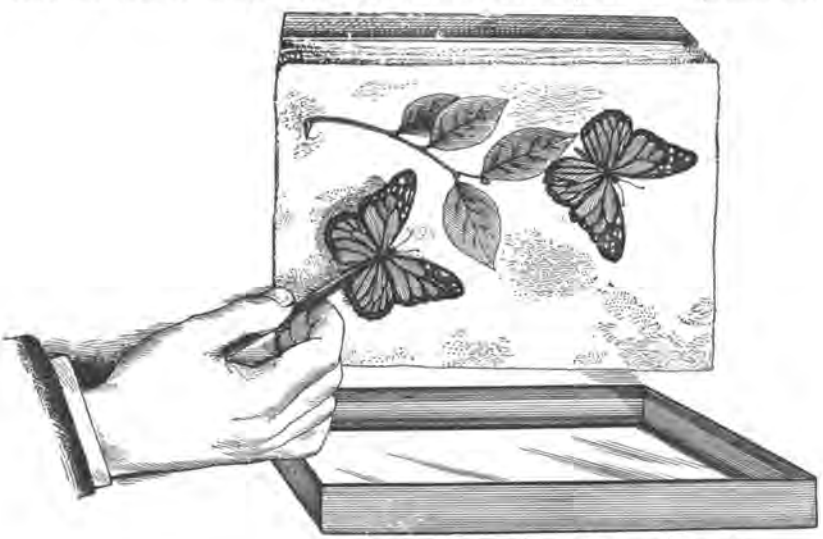
They are made of soft wood with single bottom, and are stained in imitation of oak or cherry. Clear glass cover, lifting and fitting in groove, so as to make them dust and insect proof.

		Price
ES–494.	**Exhibition case,** 8 x 12 x 2¾ in., pressed cork lined.	$1.25
ES–495.	**Exhibition case,** 8 x 12 x 2¾ in., patent cork lined.	1.55
ES–496.	**Exhibition case,** 12 x 16 x 2¾ in., pressed cork lined.	2.75
ES–497.	**Exhibition case,** 12 x 16 x 2¾ in., patent cork lined.	3.25
ES–498.	**Exhibition case,** 14 x 22 x 2¾ in., pressed cork lined.	4.00
ES–499.	**Exhibition case,** 14 x 22 x 2¾ in., patent cork lined.	4.50
ES–499a.	**Exhibition case,** 18 x 24, pressed cork lined.	5.50
ES–499b.	**Exhibition case,** 18 x 24, patent cork lined.	6.00
ES–499½.	**Metamorphosis cases of heavy pasteboard,** with clear white glass cover, pressed cork lined, 8 x 12	1.00

N.B.—Special cases of all kinds made to order.

RIKER SPECIMEN MOUNTS

The Riker specimen mount is a dust tight mount, with which no pins are needed. It consists of a cardboard box with glass cover, filled with specially prepared cotton. The insect is placed on the cotton, and is held in place by the pressure of the glass when the case is closed. The case is then sealed up and the specimen is safe.



ES–1000. Riker Mount (Open).

The specimen mount is suitable for butterflies, beetles, dragon flies, grasshoppers, bees, fungi, shells or thick plants or bulbs too large for the botanical mount.

PRICE LIST OF RIKER SPECIMEN MOUNTS

Ready for collector's use, in black binding

		Price Each	Per Dozen
ES–1000.	2½ x 3 inches	15c	$1.75
ES–1001.	4 x 5 inches	20c	2.30
ES–1002.	5 x 6 inches	25c	2.80
ES–1003.	6½ x 8½ inches	30c	3.50
ES–1004.	8 x 12 inches	50c	6.00
ES–1005.	12 x 16 inches	$1.00	12.00

SHIPPING BOXES

Mailing or shipping box, made of strong corrugated paper; a great convenience; every entomologist should keep a stock on hand; both lined with cork for expanded specimens, and without lining for papered or alcoholic specimens.

	Length	Breadth	Height	Lined	Price per doz.
ES–463.	2⅝	2	1¾		$1.00
ES–464.	2⅝	2	1¾	with cork	1.50
ES–465.	3⅛	2½	1¾		1.25
ES–466.	3⅛	2½	1¾	with cork	1.75
ES–467.	4	2½	1¾		1.50
ES–468.	4	2½	1¾	with cork	2.00
ES–469.	4⅜	3⅜	1¾		2.00
ES–470.	4⅜	3⅜	1¾	with cork	2.50

FORCEPS

ES–331½. Blake Forceps.

ES–331½. Blake forceps, square tips. $3.50. Postage extra.

ES–332. Akhurst Forceps.

ES–332. Pinning forceps, bent, Akhurst style, best quality. $1.50. Postage extra.

ES–335. Fine Curved Forceps.

ES–335. Curved forceps, very light and fine, best quality, serrated tips. 75c. Postage extra.

ES–336. Fine Rounded Point Forceps.

ES–336. Straight forceps, rounded point, excellent for picking up small parts of insects without injury, best quality. 60c. Postage extra.

N.B.—For additional forceps and dissecting instruments, see pages 120–124.

SPREADING BOARDS

We call particular attention to our spreading boards, which have been pronounced by the eminent entomologist, Mr. Jacob Doll of the Brooklyn Institute of Arts and Science, "the best on the market." They are made in our own factory, and great care is taken to insure their being true. The plates are made of very soft wood, the small sizes lined with soft yucca, the medium and large with cork. The space in the center affords a resting place for the point of the pin, while the height of the insect on the pin is determined by the board.

A. E. CO.'S STANDARD SPREADING BOARDS

Code	ES–560	ES–561	ES–562	ES–563	ES–564	ES–565	ES–566	ES–567
Length, inches	19	19	19	19	19	19	19	19
Opening, inches	1/16	1/8	3/16	1/4	5/16	3/8	1/2	3/4
Supports	4	4	4	4	4	4	4	4
Price	$ .65	.65	.65	.70	.70	.75	.80	.80

Code	ES–568	ES–569	ES–570	ES–571	ES–572	ES–573	ES–574	ES–575
Length, inches	12	12	12	12	12	12	12	12
Opening, inches	1/16	1/8	3/16	1/4	5/16	3/8	1/2	3/4
Supports	2	2	2	2	2	2	2	2
Price	$ .40	.40	.40	.45	.45	.45	.45	.50

ADJUSTABLE SPREADING BOARDS

Imported adjustable patent spreading boards of the softest linden wood.

ES–580. Adjustable spreading board. Plain, no guide lines. Size, 14 in. long, 6 in. wide. $1.00.

ES–581. Adjustable spreading board. Provided with guide lines. Size, 13 in. long, 5½ in. wide. $1.00.

ES–582. Adjustable spreading board. Provided with guide lines. Size, 13 in. long, 4½ in. wide. 90c.

ES–583. Adjustable spreading board. Provided with guide lines. Size, 13 in. long, 3½ in. wide. 80c.

ES–584. Adjustable spreading board. Provided with guide lines. Size, 13 in. long, 2¾ in. wide. 70c.

THE BAUSCH & LOMB OPTICAL CO.'S MICROSCOPES, MAGNIFIERS AND POCKET LENSES

ES–358

Magnifiers, folding, oval shape, vulcanite mounting, with two lenses

Code No.	ES–358	ES–359	ES–360
Diameter, mm.	15 & 20	25 & 30	30 & 37
Price (postage extra)	$1.20	$1.80	$2.40

Magnifiers, bellows shape, aluminum mounting, with three lenses

ES–369. Diameter of lens, 12, 15 and 18mm. Price $1.80 each. Postage extra.

THE BAUSCH & LOMB CO. ACHROMATIC TRIPLET

ES–372. Triple Aplanatic, made in two styles, either folding pocket case or for dissecting microscope.

Working distance	1½	1	⅝	½
Diameter of field	1½	1⅛	⅜	⅛
Magnification	7½	10	15	20
Price (Postage extra)	$6.00	6.00	6.00	6.00

ES–375. Hastings Aplanatic Triplet Magnifiers. These are among the most perfect magnifiers produced, furnished in two styles of mounting, either folding pocket case or for dissecting microscope.

Working distance	1½	1	¾	½
Diameter of field	1⅛	1⅛	⅜	⅛
Magnification	7	10	14	20
Price (Postage extra)	$7.50	7.50	7.50	7.50

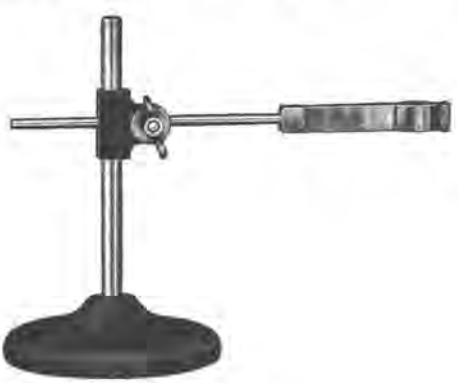
Mounting for Dissecting Microscope, $7.25

CODDINGTON MAGNIFIERS

These are made on the well known "Coddington" principle, and while not the equal of ES–372 and ES–375, are superior to the simple magnifiers. Furnished in two styles of mounting, either folding case, nickel plated, or for dissecting microscope. We recommend these particularly for entomological purposes.

ES–377. Coddington Magnifier

Working distance	1½	1	¾	½
Diameter of field	1⅛	1⅛	⅜	⅛
Magnification	7	10	14	20
Price (Postage extra)	$3.00	3.00	3.00	3.00



ES–386

ES–382

ES–382. Tripod dissecting microscope, with screw adjustment for focusing lens, finely finished. 75c. Postage extra.

ES–386. Adjustable stand for dissecting microscope. $5.50. Postage extra.

N.B.—With this stand are used our ES–374 to ES–377 magnifiers, when ordered for dissecting microscope.

ES–387

ES–387. This dissecting microscope is intended for the examination of gross specimens in biological work and for dissections under comparatively low magnification. The double lens, giving a large, clear field, is in a threaded mounting for focusing.

The wooden stand, is shaped to provide hand rests; base measures 245 x 73 mm., with space in one end for accessories; stage of glass, 85 x 57 mm., removable; lens arm swings across field on revolving post; distance from center of post to center of lens, 45 mm.; plane mirror 75 x 69 mm., mounted at proper angle beneath stage and removable.

ES–390, Type W.

ES–388. Bausch & Lomb dissecting microscope, type U. This instrument is well made and nicely finished. It is intended for class and laboratory use. The focusing adjustment is by means of a sliding rod, which is accurately fitted in the standard supporting the stage. Stage is provided with removable spring clips. Removable glass stage 80 x 66 mm. Lens holder is provided with society-screw. The instrument is furnished in wooden case with handle. Price, complete with lens, $20.00.

ES–389. Metal hand rest, for above, per pair, $1.25. Postage extra.

ES–390. Dissecting microscope, type W, same as above, but provided with rack and pinion instead of sliding adjustment. Price, complete with lens and hand rest, $26.75.

BAUSCH & LOMB MICROSCOPE

ES–392. Model AA.

Model AA

This is a new microscope at a low price for the elementary school laboratory. The base is detachable for examination of opaque objects, while transparent slides may be observed with the complete instrument. The mirror can be removed from the base and placed in a hole provided for it above the stage for illumination of opaque specimens. A standard 5x eyepiece and a 5.8x divisible objective is supplied. The lower element of this objective is held in place by spring tension and swings aside instead of unscrewing, which eliminates danger of loss. A 12.5x eyepiece may be had as optional equipment or can be purchased separately.

ES–392AA as described $29.50

Model FS

Microscope 398 FS is essentially a school instrument because it answers every requirement of the elementary school laboratory for a Compound Microscope. It is equipped with coarse and fine adjustments. Fine adjustment is Bausch & Lomb patented side lever type which ceases to act when objective touches the slide. An iris diaphragm is provided beneath the stage. Furnished complete in hard wood case with brass lock and key.

ES–398a. FFS-2 as described with 16.4 mm. objectives, double revolving nosepiece and 7.5x eyepiece, $71.75.

ES–398b. FS-4, same as above, but with 5x and 10x eyepieces, $74.50.

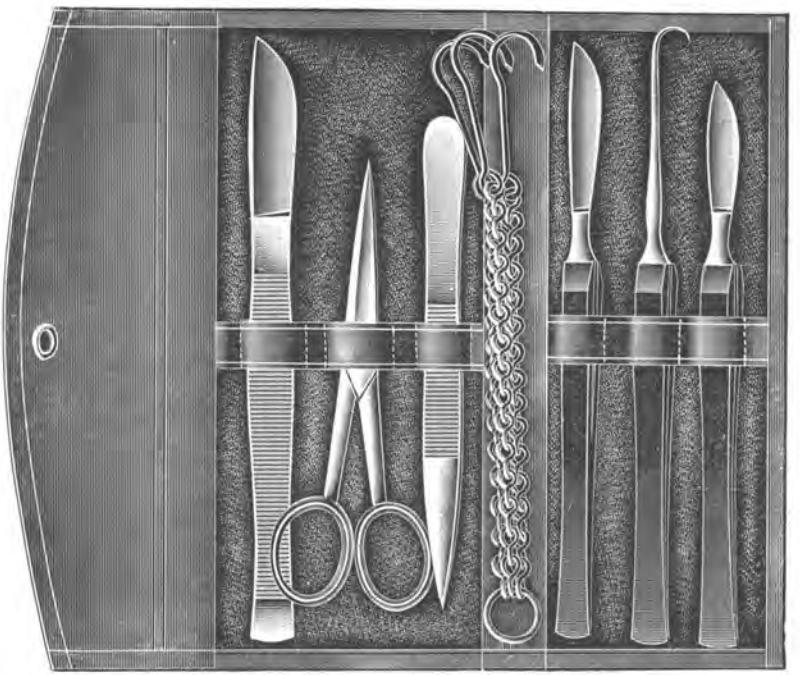
ES–398. Model FS.

DISSECTING INSTRUMENTS

DISSECTING SETS

ED–1. Wooden case. Leatherette cover. 11 instruments. Price $9.50

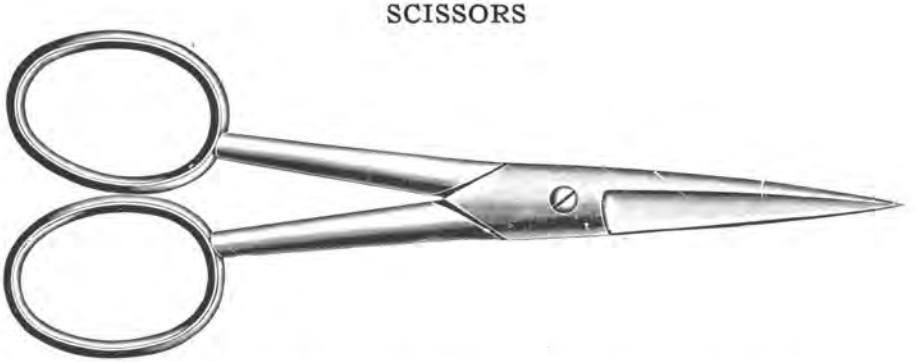
ED–2. Leatherette case, containing 7 instruments. Price $1.50



ED–3. Leatherette case, containing 7 instruments, ebony handles. Price $4.50

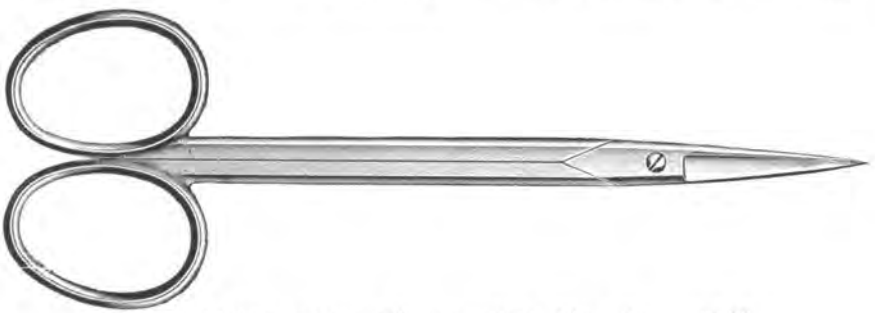
ED–4. As above but with steel handles. Price $6.50

SCISSORS



ED–5. Solid steel scissors, 4½ inches. Each 60c. Dozen $5.00.

ED–6. Very delicate points scissors, 4½ inches. Each 85c. Dozen $9.00.



ED–7. Heavy pattern scissors. Each 70c. Dozen $7.00.

FORCEPS

ED–8. Fine points forceps, 4½ inches. Each 50c. Dozen $5.00.

ED–9. Fine points forceps, 4¾ inches. Each 20c. Dozen $2.00.

ED–10. Fine points forceps, 4½ inches. Each 60c. Dozen $6.00.

ED–11. Broad points forceps, 4½ inches. Each 60c. Dozen $6.00.

SCALPELS

ED–15 ED–16 ED–17

ED–15.	**All metal scalpel,** satin finish	Each	50c	Dozen	$ 5.00
ED–16.	**Scalpel with wooden handle,** two inch blade		50c		5.50
ED–17.	**All metal scalpel,** polished		$1.10		12.00

NEEDLES

ED–12. Wooden handle needles. Dozen 40c.

ED–13. Wooden handle needles. Dozen 85c.

ED–14. Wooden handle needles. Dozen 60c.

SECTION VI.
PRESERVED ZOOLOGICAL MATERIAL

The following list contains the material we supply by the dozen for study and dissections. We refer the teachers looking for single specimens to our list on pages 75–104 all of which we can supply unmounted at reduced prices.

PROTOZOA

DA–1.	**Amoeba,** a living culture enough for 12 students	$1.50
DA–2.	**Paramoecium,** a living culture enough for 12 students	1.50
DA–3.	**Noctiluca,** preserved for 12 students	1.00
DA–4.	**Foraminiferal** sands from many localities, exceptionally good for microscope slides, per capsule	.50
DA–5.	**Radiolarial** sand from Bahamas, very beautiful material, small capsule	.50

PORIFERA (THE SPONGES)
CLASS CALCAREA

		Price per dozen
DB–1.	**Grantia,** the common calcareous sponge	$.50–.75
DB–2.	**Sycon,** a closely related form	.75
DB–3.	**Leucosolenia,** a typical Ascon sponge	.60

CLASS HEXACTINELLIDA

DB–5. **Glass ropes** from the glass rope sponge Hyalonema sieboldii. Each $ .75

See page 92 for Museum specimens.

CLASS DEMOSPONGIA

DB–10.	**Spongilla,** a fresh water sponge	.75
DB–11.	**Small commercial sponges,** dry	1.00

COELENTERATA
CLASS HYDROZOA

Order Hydrariae

DC–1.	**Hydra,** large specimens carefully preserved with tentacles extended	.75
DC–1a.	**Hydra,** showing buds	1.50
DC–1b.	**Hydra** with sex organs	3.00

Order Tubulariae

DC–2.	**Eudendrium,** a tubularian hydroid colony	.75
DC–3.	**Pennaria,** a tubularian hydroid colony	.75
DC–4.	**Tubularia,** hydroid colony	.90

Order Campanulariae

DC–5.	**Obelia,** a campanularian hydroid colony	.75
DC–5a.	**Obelia,** medusae	.75
DC–6.	**Campanularia,** hydroid colony	.90
DC–7.	**Plumularia,** colony nicely expanded	.90
DC–8.	**Sertularia,** sertularian hydroid colony	.75

Order Trachomedusa

DC–15.	**Gonionemus,** finely expanded Trachomedusa	1.75

Order Siphonophora

DC–20. **Vellela spirans,** sea float. Each $ .50

See pages 89–93 for Museum specimens.

CLASS SCYPHOZOA

per dozen Price

DC–25. Aurelia flavidula, our specimens are carefully preserved and of medium size, the best for study purposes $2.00– $3.00

See page 90 for Museum specimens.

CLASS ANTHOZOA

DC–30. Astrangia, the northern coral, small pieces with polyps expanded 3.00
DC–31a. Metridium marginatum, full expanded sea anemones, large 4.00
DC–31b. Metridium marginatum, medium 3.00
DC–31c. Metridium marginatum, small 2.00
DC–32. Renilla, Sea Pansy (Each .50) 3.00
DC–33. Madrepora, a branching coral, small pieces, dry 1.50
DC–34. Dichocoenia, a spherical coral, dry 3.00

See page 90 for Museum specimens.

CLASS CTENOPHORA (COMB-JELLIES, ETC.)

DC–40. Pleurobrachia, well expanded 2.50

PLATYHELMINTHES (FLAT WORMS)

CLASS TURBELLARIA

DD–1. Bdelloura candida, a parasite worm from the King Crab ..... .75
DD–2. Planaria sp., a fresh water form ..... .60
DD–3. Thyanozoon brocchi, a large marine planarian from Naples. Each $ .50

CLASS TREMATODA

DD–10. Fasciola (Distomum) hepaticum, the liver fluke 2.50

CLASS CESTODA

DD–15. Dipylidium caninum, Dog tape worm, complete with scolex 3.50
DD–16. Moniezia expansa, sheep tape worm, scolex with segments 3.50
DD–17. Taenia from man, proglottids only 1.00

CLASS NEMERTEA

See Museum specimens, page 85.

NEMATHELMINTHES (ROUND WORMS)

DE–1. Ascaris lumbricoides 1.50
DE–2. Gigantorhynchus (Echinorhynchus) from the pig 2.00
DE–3. Ancylostoma, Hook worm from India 2.50

CHAETOGNATHA

DE–10. Sagitta, the arrow worm ..... .50

BRYOZOA

DF–1. Bugula (Bird's head coralline) ..... .75

N.B.—Write for special list of dry Bryozoans.

BRACHIOPODA (THE LAMP SHELLS)

DG–1. Terebratalia transversa, a medium sized plicated form from the West Coast 2.50
DG–2. Laqueus californicus, a fine large species 3.00

N.B.—We have many shells only of other recent brachiopods, list upon request.

ECHINODERMATA

CLASS CRINOIDEA (THE SEA LILIES)

DH–1. Antedon rosaceus, the feather star. Each $2.00.

See page 86 for Museum specimens.

CLASS OPHIUROIDEA

DH–10. Ophiura sp. (Serpent Star Fish) 1.50

CLASS ASTEROIDEA

DH–20. Asterias forbesi, the common starfish of the East Coast, specimens 5″ or over 2.00

N.B.—See Museum specimens, page 86 for additional dried forms.

CLASS ECHINOIDEA (THE SEA URCHINS)

		Price per dozen
DH–30.	**Arbacia punctulata,** the purple sea urchin	$2.00
DH–31.	**Strongylocentrotus drobachiensis,** the green sea urchin	1.75
DH–32.	**Echinarachnius parma,** sand dollar	1.25
DH–33.	**Dendraster excentricus,** West Coast sand dollar, dry	.75

CLASS HOLOTHUROIDEA

DH–40.	**Cucumaria (Pentacta) frondosa,** Northern sea cucumber	2.50
DH–41.	**Thyone briareus,** Sea Cucumber	2.50

ANNELIDA (THE ANNULATED WORMS)

DI–1.	**Amphitrite ornata**	2.25
DI–2.	**Arenicola,** lug worm	3.00
DI–3.	**Clymenella,** a tube worm	1.00
DI–4.	**Lumbricus,** Earthworm, carefully selected specimens of mature worms showing clitellum, all specimens are straight and plump. Per 100 $6.00	.75
DI–5.	**Nereis virens,** the green clam worm of the East Coast of the U. S.	1.25
DI–6.	**Nereis sp.** somewhat smaller, from Naples	1.00
DI–10.	**Leeches,** large specimens, well expanded	1.25

MOLLUSCA

CLASS PELECYPODA (BIVALVE MOLLUSKS)

DK–1.	**Lampsilis,** fresh water mussel, the valves are held apart by pegs so that they can be easily opened for study, size 5″ or over	$1.00
DK–2.	**Unio,** prepared as above but somewhat smaller 2½″ to 3″	.75
DK–3.	**Modiola,** salt water mussel	.75
DK–4.	**Mya arenaria,** the long neck clam	1.00
DK–5.	**Ostraea borealis,** the common oyster	1.00
DK–6.	**Pecten sp.** the scallop	1.00
DK–7.	**Venus mercenaria,** the little neck clam	.75

CLASS AMPHINEURA

DK–10.	**Chitons,** large size from Bermuda and the West Coast	2.00

CLASS GASTROPODA

DK–20.	**Aeolis sp.,** nudibranch or sea slug	1.75
DK–21.	**Helix pomatia,** the large edible snail of Europe, fully expanded	1.50
DK–22.	**Polygyra albolabris,** the common garden snail of the East, fully expanded	1.00
DK–33.	**Bulimulus,** a tree snail from Texas not quite so large as Polygyra	.75
DK–24.	**Buccinum,** the whelk	1.00
DK–25.	**Scurria gigantea,** the large west coast limpet	.75
DK–26.	**Limax,** the garden slug	2.00
DK–27.	**Pterotrachea,** a heteropod	4.00

CEPHALOPODA

DK–40. Loligo pealii, the common squid, carefully preserved specimens .. 2.00– 2.50
See Demonstration material for additional forms.

N.B.—We have a one hundred and twenty-five page catalogue with over 100 illustrations covering our stock of shells. This is mailed free of charge to teachers and sold to others at 55 cts. the cost of publishing.

ARTHROPODA

CLASS CRUSTACEA

Order Decapoda

		Price per dozen
DLA–1.	**Cambarus,** large selected specimens of the Eastern crayfish 3½–4″ bodies. Per 100 $7.00	$1.00
DLA–1a.	**Cambarus,** smaller 2½″–3″. Per 100 $5.50	.75
DLA–2.	**Potamobius,** the very large western crayfish average length of body 6″	3.00
DLA–3.	**Homarus americanus,** Northern Lobster	6.00
DLA–4.	**Callinectes,** the edible blue crab, a swimming crab	2.00
DLA–5.	**Cancer,** the rock crab	1.50
DLA–6.	**Crangon vulgaris,** shrimp	.75
DLA–7.	**Hermit crab** in shell, medium size .75–	1.00
DLA–8.	**Uca (Gelasimus) pugilator,** the fiddler crab	.75
DLA–9.	**Hippa talpoides,** mole crab	1.50

Order Amphipoda

DLA–15.	**Orchestia sp.,** sand flea	.40
DLA–16.	**Gammarus sp.,** the beach hopper, an amphipod	.40

Order Isopoda

DLA–20.	**Asellus,** a fresh water isopod	.50
DLA–21.	**Oniscus,** the sow bug	.40

Order Branchiopoda

DLA–25.	**Branchipus vernalis,** the fairy shrimp, a fresh water phyllopod	.50
DLA–26.	**Daphnia,** a cladocerian	.50

Order Copepoda

DLA–30.	**Cyclops,** an unusually large form	.50

Order Cirripedia

DLA–35.	**Balanus sp.,** common barnacle	.50
DLA–36.	**Lepas,** the goose barnacle	.75
DLA–37.	**Pollicipes polymerus,** crown barnacle	.75

CLASS ARACHNIDA

Order Xiphosura

DLB–1.	**Limulus polyphemus,** the king crab 3″ to 4″ specimens	2.00

Order Scorpionidea

DLB–5.	**Scorpions,** large from West Coast	2.50
DLB–5a.	**Scorpions** from Florida	1.00

Order Araneae (The Spiders)

DLB–10.	**Argiope riparia,** the garden spider, a large form	.75

See demonstration material, page 78 for other forms.

Order Acarina (The Ticks and Mites)

DLB–15.	**Amblyomma,** tick	.75
DLB–16.	**Margaropus,** sheep tick	.75

CLASS ONYCHOPHORA

DLC–1.	**Peripatus,** New Zealand, this rare and interesting form in some respects bridges the interval between the Arthropoda and the Annulata. Single spec. $2.00	20.00

CLASS MYRIAPODA (THE HUNDRED LEG WORMS)

Order Chilopoda

		Price per dozen
DLD–1.	**Scolopendra,** a large centipede from the South	$2.00
DLD–2.	**Lithobius,** the small centipede of the North	.50

Order Diplopoda

DLD–5.	**Spirobolus,** the large millepede	1.00
DLD–6.	**Julus,** the small millepede	.40

CLASS INSECTA

Order Aptera—Thysanura cf Packard

DLE–1.	**Lepisma,** the silver fish	.75

Order Orthoptera (Cockroaches, Grasshoppers, Stick Insects, etc.)

DLE–10.	**Diaphemora femcrata,** Northern walking stick	1.50
DLE–11.	**Anisomorpha buprestoides,** Southern walking stick	2.00
DLE–12.	**Stagmomantis religiosa,** the praying mantis	2.50
DLE–13.	**Periplaneta americana,** large cockroach	.75
DLE–13a.	**Periplaneta americana,** nymphs	.75
DLE–13b.	**Periplaneta americana,** egg cases	1.00
DLE–15.	**Rhomaleum,** the large lubber grasshopper with short wings from the South carefully preserved in alcohol for dissection. Per 100 $6.50	.75
DLE–15a.	**Rhomaleum nymphs,** various stages	1.00
DLE–15b.	**Rhomaleum,** sets for life history, containing eggs, 4 nymphs & male and female adult. Each $1.25	9.00
DLE–16.	**Acridium (Schistocerca) americanum,** the long winged southern grasshopper. Per 100 $6.00	.75
DLE–17.	**Melanoplus differentialis,** a medium sized western grasshopper. Per 100 $3.50	.50
DLE–18.	**Melanoplus femur-rubrum,** the common grasshopper of the East about 1″ long. Per 100 $2.50	.35
DLE–19.	**Long-horned grasshopper**	.75
DLE–20.	**Microcentum,** the katydid	.75
DLE–21.	**Gryllus sp.,** House Cricket	.50

Order Dermoptera (The Ear Wigs)

DLE–25.	**Earwigs from Florida**	.75

Order Odonata (Dragon and Damsel Flies)

DLE–30.	**Dragon flies,** large in alcohol	1.25
DLE–30a.	**Dragon flies,** smaller in alcohol	.60
DLE–30b.	**Dragon flies,** nymphs in alcohol	.60
DLE–31.	**Damsel flies,** in alcohol	.50

Order Anoplura (Parasite Lice)

DLE–40.	**Pediculus capitis,** human head lice	.50
DLE–40a.	**Pediculus capitis,** eggs attached to hairs	.40
DLE–41.	**Pediculus vestimenti** (body lice)	.50

Order Mallophaga (Parasite Lice)

DLE–45.	**Lipeurus,** pigeon lice	.50

Order Hemiptera (The True Bugs)

DLE–50.	**Anasa tristis** (the squash bug)	.40
DLE–51.	**Benacus,** giant electric light bug	1.00
DLE–52.	**Cimex lectularius** (bed bug)	.50
DLE–53.	**Gerris,** water-strider	.50
DLE–54.	**Ranatra,** water scorpion	.75

Order Homoptera

		Price per dozen
DLE–60.	**Aphids** or plant lice	$.30
DLE–61.	**Cicada septendecim,** the seventeen year locust	.75
DLE–62.	**Cicada rimosa,** a somewhat smaller form	.75
DLE–63.	**Tree and Leaf** hoppers	.40

Order Thysanoptera (The Thrips)

DLE–70.	**Thrips,** mixed species	.50

N.B.—Prof. Hood of the University of Rochester is the authority on thrips and he has prepared a series of slides representing the different genera. This set is described on page 146.

Order Lepidoptera

DLE–80.	**Anosia plexippus,** the monarch butterfly, dry in papers	.75
DLE–81.	**Pryameis cardui,** nearly the same size as the Monarch, dry in papers	.60
DLE–82.	**Pieris rapae** (the cabbage butterfly) medium size, dry in papers	.40
DLE–82a.	**Cabbage butterfly** in alcohol	.60
DLE–82b.	**Cabbage butterfly,** larvae in alcohol	.50
DLE–82c.	**Cabbage butterfly,** pupae in alcohol	.60
DLE–83.	**Exotic butterflies,** many species none smaller than the cabbage butterfly and many larger than the Monarch. Per 100 $6.00	1.00
DLE–90.	**Samia cecropia,** the large cecropia Moth, dry in papers	1.25
DLE–90a.	**Samia cecropia** in alcohol	1.50
DLE–90b.	**Samia cecropia** larvae in alcohol	1.50
DLE–90c.	**Samia cecropia** pupae in alcohol	1.00
DLE–91.	**Callosamia promethea,** imagos in papers	1.25
DLE–92.	**Phylosamia cynthia,** imagos in papers	1.25
DLE–93.	**Telea polyphemus,** the polyphemus moth, dry	1.25
DLE–94.	**Protoparce carolina,** large sphinx moth, dry ea. .25	
DLE–94a.	**Protoparce carolina,** sphinx larvae 3" long carefully preserved in alcohol for dissection	1.50
DLE–95.	**Mixed exotic moths,** large to medium, dry in papers, very interesting for study as many families are represented. Per 100 $12.00	2.00

N.B.—We have many thousands of identified butterflies and moths, if you have a collection, let us send you our lists.

Order Coleoptera (The Beetles)

DLE–100.	**Allorhina nitida,** the green scarab beetle	.40
DLE–101.	**Carabus nemoralis,** a favorite beetle for dissection	.40
DLE–102.	**Cotalpa,** the gold bug	.75
DLE–103.	**Dytiscus,** Predaceous water beetle, large	.75
DLE–103a.	**Dytiscus** larvae	1.00
DLE–104.	**Harpalus caliginosus,** a large ground beetle	.60
DLE–105.	**Passalus cornutus,** a stag beetle	.50
DLE–106.	**Lachnosterna,** June beetle	.40
DLE–106a.	**Lachnosterna,** larvae	1.00
DLE–106b.	**Lachnosterna,** pupae	3.00
DLE–107.	**Hydrophilus,** a large water scavenger beetle	1.00
DLE–108.	**Leptinotarsa,** Colorado potato beetle	.30
DLE–108a.	**Leptinotarsa,** larvae	.30
DLE–108b.	**Leptinotarsa,** pupae	.75

N.B.—For life histories and collections of Beetles and other insects, see pages 95–104.

Order Hymenoptera

		Price per dozen
DLE–120.	**Apis mellifica,** the honey bee, adult workers in alcohol	$ .40
DLE–120a.	**Apis mellifica,** larvae workers in alcohol	.50
DLE–120b.	**Apis mellifica,** pupae workers in alcohol	.40
DLE–120c.	**Apis mellifica,** drones in alcohol	.50
DLE–120d.	**Apis mellifica,** drones larvae	.50
DLE–120e.	**Apis mellifeca,** queens in alcohol. Each 1.00.	
DLE–121.	**Bombus,** the bumble bee, large size	.50
DLE–122.	**Polistes,** the social wasp	.75
DLE–122c.	**Polistes,** larvae	.75
DLE–122b.	**Polistes,** pupae	.75
DLE–123.	**Vespa,** mixed species of wasps and yellow jackets	.40
DLE–125.	**Formica,** ant	.25
DLE–126.	**Pelecinus polyturator**	1.00

Order Siphonaptera (The Fleas)

DLE–130.	**Ctenocephalus canis,** dog flea	.75

Order Diptera (The True Flies)

DLE–140.	**Asilis,** the robber flies	.50
DLE–141.	**Calliphora,** Blow fly	.50
DLE–141a.	**Calliphora,** larvae	.75
DLE–142.	**Lucilia,** Blue Bottle fly	.40
DLE–143.	**Musca domestica,** House fly, adults	.25
DLE–143a.	**Musca domestica,** House fly, larvae	.50
DLE–143b.	**Musca domestica,** House fly, pupae	.50
DLE–144.	**Stomoxys,** the stable fly	.60
DLE–145.	**Tabanus atratus,** large horse fly	1.00
DLE–146.	**Tabanus sp.,** medium horse fly	.50
DLE–150.	**Culex pipiens,** house mosquito, adults	.35
DLE–150a.	**Culex pipiens,** larvae	.35
DLE–150b.	**Culex pipiens,** pupae	.35
DLE–150c.	**Culex pipiens,** egg boats	.50
DLE–155.	**Crane flies** (Tipulidae)	.60

N.B.—See Section V. pages 95–104 for special collections of insects.

PHYLUM CHORDATA

SUB-PHYLUM ENTEROPNEUSTA

DM–.	**Balanoglossus,** whale's tongue, complete specimens carefully preserved	3.00

SUB-PHYLUM TUNICATA (THE SEA SQUIRTS, ASCIDIANS)

DN–1.	**Molgula manhattensis,** common ascidian	1.00
DN–2.	**Pyrosoma,** Fire body	4.00
DN–3.	**Corella,** Glassy tunicate	1.25

SUB-PHYLUM (CEPHALOCHORDATA)

DO–1.	**Amphioxus,** good size carefully prepared in alcohol	1.50
DO–2.	**Amphioxus,** small specimen for whole microscope slide mounts	2.50

SUB-PHYLUM VERTEBRATA

CLASS CYCLOSTOMATA

DPA–1.	**Petromyzon marinus,** large sea lamprey from New Hampshire	8.00
DPA–2.	**Petromyzon marinus,** a smaller form from New York, adults 13″ to 18″	6.00
DPA–2a.	**Petromyzon,** larvae, Ammocoetes from 50 to 100mm. ea.	1.00
DPA–2b.	**Petromyzon,** eggs various stages, 1, 2, 4, 8, 16 cells, blastula, gastrula, early embryo, late embryo, each stage	1.00

CLASS SELACHII (SHARKS & RAYS)

		Price per dozen
DPB–1.	**Squalus acanthias** 24″–30″	$6.00
DPB–1a.	**Squalus acanthias,** pups with yoke sack attached	3.00
DPB–1b.	**Squalus,** heads for brains	4.00
DPB–2.	**Skates or rays**	5.00

CLASS PISCES

DPC–1.	**Perca flavescens,** large size 7″–8″	2.00

CLASS AMPHIBIA

Order Caudata (Salamanders, etc.)

DPD–1.	**Amblystoma,** larvae, the axolotl, very large 10″ to 12″	4.00
DPD–2.	**Amblystoma,** larvae, smaller	2.50
DPD–3.	**Amblystoma,** adults, large	3.00
DPD–4.	**Smaller salamanders,** various species	1.50
DPD–5.	**Diemyctilus viridescens** Newt	1.50
DPD–6.	**Necturus maculatus,** mud puppy, full size	10.00
DPD–7.	**Siren lacertina,** the siren. Each $2.00	
DPD–8.	**Amphiuma,** the Congo eel. Each $2.50	
DPD–9.	**Cryptobranchus,** the hell bender. Each $1.25	

Order Anoura (Frogs and Toads)

DPD–15.	**Rana pipiens,** the grass frog, large size 3 inch bodies carefully preserved, each specimen injected and hardened in straight position	2.50
DPD–15a.	**Rana pipiens,** smaller, average length of body 2 to 2½″ preserved as above	1.50
DPD–15b.	**Rana tadpoles,** no feet	.50
DPD–15c.	**Rana tadpoles,** 2 feet	.50
DPD–15d.	**Rana tadpoles,** 4 feet and long tail	.75
DPD–15e.	**Rana tadpoles,** 4 feet and stump tail	.75
DPD–15f.	**Rana eggs,** all stages of segmentation, 1, 2, 4, 8, 16 cell, early and late blastula, dozen of single stage	.50
DPD–15g.	**Rana,** gastrula, crescent shaped blastopore, early and late yoke plugs. Per dozen of one stage	.50
DPD–15h.	**Rana,** early embryo	.50
DPD–15i.	**Sets of ten stages** from one cell through early embryo (per set $2.50)	7.50
DPD–16.	**Rana catesbiana,** large bull frog 6″ bodies injected and hardened	12.00
DPD–17.	**Bufo americanus,** common toad	1.50
DPD–17a.	**Toad** tadpoles	.75
DPD–17b.	**Toad** eggs	.75

N.B.—For other Amphibians see Museum specimens pages 69 to 71.

CLASS REPTILIA

DPE–1.	**Anolis carolinensis,** the American chameleon	3.00
DPE–2.	**Sceloporus,** pine lizard	4.00
DPE–5.	**Snakes,** mixed species 12″–18″	3.00
DPE–5a.	**Snakes,** larger 24″–36″	5.00
DPE–10.	**Chrysemys picta,** the painted tortoise, carapace measuring 6″ to 8″ with shell sawed to allow dissection	5.00
DPE–15.	**Alligators** 9″ to 15″	18.00

N.B.—For other Reptiles see Museum specimens pages 66 and 67.

CLASS AVES

DPF–1.	**Pigeons,** bodies injected and hardened in formalin. Each $1.00	9.00
DPF–2.	**English Sparrows** preserved in formalin	3.00

CLASS MAMMALIA

DPG–1.	**Cats** skinned and hardened in formalin. Each $2.00	18.00
DPG–1a.	**Cats** brains hardened in formalin. Each $1.50	10.00
DPG–2.	**Bats** in formalin	6.00
DPG–3.	**Sheeps** Brains. Each $1.75	18.00
DPG–3a.	**Sheeps** eyes	3.00

SECTION VII.
MICROSCOPE SLIDES

Our 28 page catalogue of Microscope Slides covering Botany, Zoology, Histology and so on will be sent free of charge to those interested. We list here only the slides in greatest demand.

A. BOTANY

I. ALGAE

A. Cyanophyeae (Blue Green Algae)

B–4. Gloeotrichia, showing spores, heterocysts, etc. ..... $.50
B–6. Nostoc, filaments, heterocysts & occasional spores ..... .50

B. Chlorophyceae (Green Algae)

B–13. Volvox, whole colony 1.00
B–18. Pleurococcus, irregular colonies ..... .50
B–27. Oedogonium ..... .50
B–32. Desmids ..... .50
B–37. Spirogyra (vegetative) ..... .50
B–39. Spirogyra (conjugation & zygospores) ..... .50
B–46. Vaucheria, fruiting ..... .50
B–49. Diatoms, strewed slides from various localities ..... .40
B–53. Chara, l.s. through antheridia .60

C. Phaeophyceae (Brown Algae)

B–58. Ectocarpus, vegetative cells and gametangia w.m. ..... .50
B–72. Fucus T.S. of thallus through conceptacles ..... .50

D. Rhodophyceae (Red Algae)

B–79. Nemalion w.m. ..... .50
B–89. Polysiphonia, sexual plant with tetraspores ..... .50

II. FUNGI

A. Myxomycetes

B–105. Stemonitis, showing spores w.m. ..... .50

B. Phycomycetes

B–111. Rhizopus, sporangia & zygospores w.m. ..... .50
B–116. Saprolegnia, sporangia & sexual stages ..... .50

C. Ascomycetes

B–120. Aspergillus (Eurotium) conidia ..... .50
B–130. Exoascus, section of infected leaf showing asci ..... .50
B–139. Peziza, showing ascospores .50
B–143. Yeast (Saccharomyces) budding ..... .50

D. Basidiomycetes

B–146. Wheat Smut (Tilletia) chlamydospores ..... $.45
B–149. Wheat Rust (Puccinia graminis) aecidial stage on barberry leaf ..... .50
B–150. Wheat rust, uredospore stage on oat or barley leaf ..... .50
B–151. Wheat rust, teleutospore stage on oat or barley leaf .50
B–154. Mushroom T.S. of gills ..... .50
B–155. Mushroom T.S. of stipe .... .50
B–156. Mushroom T.S. showing basidia & spores ..... .50

III. BRYOPHYTES

A. Hepatica (Liverworts)

B–211. Marchantia T.S. of thallus .. .50
B–213. Marchantia, section of antheridial head ..... .50
B–214. Marchantia, section of archegonial receptacle with archegonia ..... .60
B–215. Marchanta L.S. of sporophyte .50
B–231. Porella L.S. of antheridial branch ..... .50
B–232. Porella L.S. of archegonial branch ..... .75
B–233. Porella L.S. of sporophyte .. .50

IV. MUSCI (MOSSES)

B–305. Moss protonema ..... .50
B–307. Moss, small plants with rhizoids ..... .50
B–308. Moss, antheridial head, L.S. .50
B–310. Moss, archegonial branch L.S. ..... .60

V. PTERIDOPHYTA (FERNS, ETC.)

B–440. Pteris T.S. of leaf ..... .45
B–444. Pteris L.S. & T.S. of rhizome ..... .50
B–447. Pteris prothallus with antheridia ..... .60
B–448. Pteris prothallus with archegonia ..... .60
B–449. Pteris prothallus with young sporophyte ..... .60

VI. SPERMATOPHYTA

A. Gymnosperms

B–611. Ginkgo T.S. of leaf ..... $.45
B–635. Pinus L.S. of staminate cone .50
B–636. Pinus L.S. of male gametophyte at shedding ..... .50
B–637. Pinus L.S. of young ovulate cone ..... .50
B–638. Pinus L.S. of ovule & female gametophyte ..... .60
B–639. Pinus L.S. of embryo sporophyte ..... .60
B–640. Pinus leaf T.S. ..... .40
B–641. Pinus stem T.S. and L.S. ... .50
B–643. Pinus root T.S. ..... .45

VII. ANGIOSPERMS

A. Stems Dicotyledons

B–702. Acer negundo (Maple) T.S. .40
B–712. Cucurbita (Squash) L.S. and T.S. bicollateral bundles and sieve tubes ..... .50
B–713. Cuscuta (Dodder) on host to show haustoria ..... .50
B–723. Myriophyllum (Water Milfoil) T.S. showing air chambers ..... .45
B–729. Quercus (Oak) L.S. and T.S. showing medullary rays .. .50
B–730. Ricinus (Castor bean) L.S. and T.S. showing spiral vessels ..... .50
B–734. Tilia (Basswood) T.S. and L.S. showing annual rings .50

B. Stems Monocotyledons

B–741. Bambusa (Bamboo) T.S. sclerenchyma as main mechanical tissue ..... .40
B–752. Zea Mays (Corn) L.S. and T.S. general structure with collateral bundles ..... .50

C. Leaves, including Petioles

B–765. Begonia T.S. (water reservoirs) ..... .40
B–766. Dianthus (Carnation) T.S. (thick cuticle) ..... $.40
B–771. Ficus elastica (Rubber plant) T.S. (cystoliths and multiple epidermis ..... .40
B–775. Oleander T.S. typical xerophyte ..... .40
B–776. Lilium (Lily) T.S. typical monocot leaf ..... .40
B–784. Syringa (Lilac) T.S. typical mesophyte leaf ..... .40
B–793. Aesculus (Horse chestnut) petiole T.S. ..... .40
B–824. Tulipa epidermis with stomata ..... .40

D. Roots

B–841. Ranunculus (Buttercup) T.S. of unthickened root ..... .45
B–844. Vicia (Bean) L.S. of root tip .50
B–845. Vicia T.S. of unthickened root .50
B–846. Vicia T.S. of root with secondary thickening ..... .50
B–860. Zea Mays (Corn) L.S. of root tip ..... .50
B–861. Zea Mays (Corn) T.S. of root tip ..... .45
B–951. Allium (Onion) skin stained to show nuclei ..... .50
B–952. Allium L.S. of root tip showing mitosis ..... .70

E. Flowers and Fruits

B–895. Lilium T.S. of anther ..... .50
B–904. Stamens, 4 mounts on one slide beautifully double stained showing types of dehiscence 1.00
B–905. Pollen grains, in situ, 4 types on one slide 1.00
B–929. Ovaries, 4 types on one slide beautifully double stained 1.00
B–914. Lilium T.S. of ovary ..... .50
B–914a. Lilium flower bud T.S. ..... .50
B–935. Ricinus cotyledon (showing storage of oil starch and proteids) ..... .50
B–937. Triticum (Wheat) L.S. of seed to show aleurone layer .50

B. ZOOLOGY

PROTOZOA

Z–2. Amoeba (3 or 4 fine examples of the giant amoeba) $1.25
Z–10a. Foraminifera, strewed slides showing many species .... .75
Z–10b. Foraminifera, type slide with 25 genera represented 3.50
Z–16. Radiolaria, strewed slide showing many species ..... .75
Z–18. Euglena viridis ..... .75
Z–31. Paramoecium ..... .50
Z–32. Paramoecium showing conjugation $1.25
Z–32a. Paramoecium showing division 1.25

N.B.—See page 137, for parasitic forms.

PORIFERA

Z–50. Euspongia officinalis T.S. ... .50
Z–54. Grantia or sycon T.S. and L.S. ..... .60
Z–55. Isolated sponge spicules .... .50

COELENTERATA

Z–100. Hydra, entire ..... $ .75
Z–100a. Hydra, budding 1.00
Z–100b. Hydra with spermaries 1.25
Z–100c. Hydra with ovaries 1.25
Z–101. Hydra T.S. ..... .50
Z–102. Hydra L.S. ..... .50
Z–104. Obelia, entire ..... .50
Z–105. Obelia, medusa ..... .50
Z–126. Sea Anemone L.S. ..... .60
Z–127. Sea Anemone T.S. ..... .50

PLATYHELMINTHES

Z–151. Planaria, entire ..... .50
N.B.—See page 137, for parasitic Forms.

NEMATHELMINTHES

Z–168. Ascaris lumbricoides T.S. ... .60
Z–169. Ascaris megalocephala, ripe eggs unfertilized 1.00
Z–169a. Ascaris megalocephala, uterus with larvae T.S. 1.00
Z–169b. Ascaris megalocephala, eggs with polar globules 1.00
Z–167c. Ascaris megalocephala, eggs with male and female pronucleus 1.00
Z–169d. Ascaris megalocephala, ripening spermatozoa 1.00

MOLLUSCOIDA

Z–250. Bugula, entire ..... .50

ECHINODERMATA

Z–300. Asterias eggs, cleavage stages .50
Z–303. Asterias, Arm, T.S. ..... .50
Z–309. Pedicellaria of Echinoderm .. .50

ANNULATA

Z–355. Nereis, clam worm T.S. .... .50
Z–357. Earthworm T.S. ..... .40
Z–358. Earthworm T.S. thru reproductive organs ..... .50
Z–359. Earthworm, anterior median sagital section showing mouth and pharynx ..... .75
Z–360. Earthworm, nerve ganglia and cord w.m. 1.25
Z–361. Earthworm spermatozoa, smear ..... .75
Z–362. Earthworm setae in situ .... .50

ARTHROPODA

Class Crustacea

Z–403. Cyclops w.m. ..... .50
Z–413. Crayfish, carapace, T.S. ..... .50
Z–414. Crayfish, nerve cord T.S. ... .50
Z–416. Crayfish, liver T.S. ..... .50
Z–417. Crayfish, pyloric chamber of stomach T.S. ..... .50
Z–418. Crayfish, flexor muscle, L.S. .50
Z–419. Crayfish, oesophagus T.S. ... .50
Z–420. Crayfish, eye L. S. ..... .50
Z–421. Crayfish, testis T.S. ..... .50

Class Insecta

N.B.—See page 138, for Parasitic Insects.

Heads & Appendages

Z–431. Head of cockroach ..... $.50
Z–455. Head of fly with proboscis extended ..... .75
Z–467. Head of Mosquito, male or female ..... .75
Z–499. Head of larvae of Beetle ... .75
Z–514. Head of Worker Bee ..... .75
Z–515. Head of Drone Bee ..... .75
Z–456. Proboscis of fly mounted flat .75
Z–468. Antennae of male or female mosquito ..... .50
Z–486. Antennae of Butterfly ..... .50
Z–519. Sting and poison sac of worker bee ..... .50
Z–523. Mouth organs of worker bee .50
Z–476. Eye of fly ..... .50
Z–505. Eye cornea of beetle ..... .50
Z–524. Eye of worker bee V.S. ..... .75
Z–525. Eye of drone bee V.S. ..... .75

Wings and Legs

Z–433. Elytron and wing of cockroach ..... .50
Z–473. Wing of fly ..... .40
Z–489. Wing scales of butterfly .... .40
Z–516. Wing of worker bee ..... .50
Z–432. Leg of cockroach 40
Z–472. Leg of fly ..... .40
Z–503. Leg with sucker of Dytiscus .50
Z–504. Rowing leg of Dytiscus .... .40
Z–517. Fore and third leg of worker bee ..... .50

Spiracles

Z–434. Spiracle of cockroach ..... .40
Z–438. Spiracle of cricket ..... .50
Z–459. Spiracle of fly ..... .40
Z–485. Spiracle of butterfly larvae .. .50
Z–507. Spiracle of Water beetle ... .50
Z–518. Spiracle and wax scales of honey bee ..... .50

Other Parts

Z–437. Gizzard of cricket ..... .50
Z–508. Gizzard of water beetle ..... .50
Z–493. Trachea of silk moth larvae .50
Z–501. Trachea of water beetle larvae .50

MOLLUSCA

Fresh Water Clam

Z–600. Liver T.S. ..... .50
Z–601. Foot T.S. ..... .50
Z–602. Heart T.S. ..... .50
Z–603. Gill T.S. ..... .50
Z–605. Cerebral ganglia ..... .75
Z–608. Kidney T.S. ..... .50
Z–611. Palp T.S. ..... .50
Z–615. Intestine T.S. ..... .50
Z–617. Glochidia ..... .50
Z–618. Radula of Gastropod ..... .50
Z–625. Creseis acicula (Pteropod) .. .60
Z–630. Squid arm T.S. through suckers ..... .50

ZOOLOGY SLIDES—continued

CHORDATA

Z–713.	Amphioxus, juv. entire	$.75
Z–714.	Amphioxus T.S.	.50

Frog

Z–732.	Blood, double stained	.40
Z–732b.	Ciliated epithelium from roof of mouth c.s.	.60
Z–732c.	Skin showing pigment cells	.50
Z–732e.	Stomach T.S.	.50
Z–732f.	Intestine T.S.	.50
Z–732g.	Liver T.S.	.50
Z–732h.	Lung T.S.	.50
Z–732i.	Kidney T.S.	.50
Z–732j.	Testes T.S.	.50
Z–732k.	Spinal cord T.S.	.50
Z–732l.	Ovary showing eggs, section	.50

Pigeon

Z–735.	Blood	.50
Z–736.	Skin sec.	.50
Z–738.	Bone sec.	.50
Z–739.	Tongue T.S.	.50
Z–740.	Gizzard T.S.	.50
Z–741.	Lung T.S.	.50

Mammalia

Z–800.	Artery and vein T.S.	.50
Z–801.	Bladder	.45
Z–802.	Blood, human	.45
Z–803.	Bone, decalcified sec.	.50
Z–804.	Bone ground C. S.	1.00
Z–805.	Bone ground L.S.	1.00
Z–806.	Cartilage, hyaline	.45
Z–807.	Cartilage, yellow elastic	.45
Z–808.	Cerebellum	.45

Mammalia (continued)

Z–809.	Cerebrum	$.45
Z–810.	Eye, L.S., through optic nerve	1.00
Z–811.	Heart	.45
Z–812.	Intestine, large T.S.	.45
Z–813.	Intestine, small T.S.	.45
Z–814.	Kidney T.S.	.45
Z–815.	Ligamentum nuchae, showing connective tissue	.45
Z–816.	Liver	.45
Z–817.	Lung	.45
Z–818.	Lymph gland	.50
Z–819.	Mammary gland	.50
Z–820.	Medulla (multipolar nerve cells)	.50
Z–821.	Muscle, involuntary, unstriated	.45
Z–822.	Muscle, voluntary, striated	.45
Z–823.	Nerve, medullated	.60
Z–824.	Nerve, nonmedullated T.S.	.50
Z–825.	Ovary; Graafian follicles	.45
Z–826.	Pancreas	.45
Z–827.	Retina, T.S.	.50
Z–828.	Scalp, human	.45
Z–829.	Skin, human	.45
Z–830.	Spinal cord, T.S.	.45
Z–831.	Spleen	.45
Z–832.	Stomach, cardiac	.45
Z–833.	Stomach, pyloric	.45
Z–834.	Tissue, adipose	.45
Z–835.	Tissue, white fibrous	.45
Z–836.	Tongue, showing taste buds	.45
Z–837.	Tooth, L.S. ground	1.00
Z–838.	Tooth, T.S. ground	1.00
Z–839.	Trachea, T.S.	.45
Z–840.	Uterus	.45

C. EMBRYOLOGY (Slides)

ECHINODERMATA

Sea Urchin

E–1.	Eggs, unsegmented w.m.	$.50
E–2.	Eggs, segmentation and blastula stages, w.m.	.50
E–3.	Eggs, gastrulae, w.m.	.50
E–4.	Eggs, mixed stages, w.m.	.50
E–5.	Eggs, mixed stages, sectioned	.50
E–6.	Pluteus larvae, w.m.	.50

Starfish

E–7.	Eggs, unsegmented, w.m.	.50
E–8.	Eggs, showing polar bodies, w.m.	.50
E–9.	Eggs, segmentation and blastula stages, w.m.	$.50
E–10.	Eggs, gastrulae, w.m.	.50
E–11.	Eggs, mixed stages, w.m.	.50
E–12.	Eggs, mixed stages, sectioned	.50
E–13.	Bipinnaria larvae, w.m.	.50
E–14.	Brachiolaria larvae, w.m.	.50

INSECTA

E–16.	Grasshopper, Trimerotropis maritima, testis, l.s. showing spermatogenesis	1.00
E–17.	Squash bug, testis, l.s. showing spermatogenesis	1.00

EMBRYOLOGICAL SLIDES—continued

AVES

Chick

E–32. 18 hour, (primitive streak) w.m. 1.00
E–33. 18 hour series, c.s. 2.00
E–34. 24 hour, w.m. 1.00
E–35. 24 hour series, c.s. 2.00
E–36. 33–36 hour, w.m. 1.00
E–37. 33–36 hour series, c.s. 2.00
E–38. 40 hour (beginning of head fold) w.m. 1.00
E–39. 40 hour series, c.s. 2.25
E–40. 48 hour, w.m. 1.00
E–41. 48 hour series, c.s. 2.25
E–42. 56 hour, w.m. 1.50
E–43. 56 hour series, c.s. 2.50
E–44. 72 hour, w.m. 1.50
E–45. 72 hour series, c.s. 2.50
E–46. 72 hour series, sagittal 2.50
E–47. 96 hour, w.m. 1.50
E–48. 96 hour series, c.s. 4.00
E–49. 96 hour series, sagittal 3.50
E–50. Hen Ovary, c.s. ..... .50
E–51. Cockerel, testis, c.s. ..... .50

MAMMALIA

Pig

E–52. Pig embryo, 6 mm., c.s. serial secs. $8.00
E–53. Pig embryo, 6 mm., sagittal serial secs. 8.00
E–54. Pig embryo, 6 mm., w.m. ... 2.00
E–55. Pig Embryo, 10 mm., c.s. serial secs. 10.00
E–56. Pig Embryo, 10 mm., sagittal serial secs. 10.00

Series of larger pig embryos can be supplied to order.

E–57. Mammalian sperm smear ... .50
E–58. Ovary of cat, c.s. ..... .50
E–59. Ovary of cat, c.s. selected slides showing Graafian follicle with ovum ..... .75
E–60. Oogenesis in ovary of rat or other mammal 1.00
E–61. Spermatogenesis in testis of rat or other mammal 1.00
E–62. Testis of cat ..... .50

D. PARASITOLOGY (Slides)

Our circular No. 241 gives a large list of parasites but we include here those usually required.

PHYLUM PROTOZOA

Class Haemaflagellata

PH–2. Trypanosoma gambiensis ... 3.00
PH–4. Trypanosoma lewisi 2.50

Class Sporozoa

PS–2. Haemogregarines in turtles blood 1.00
PS–3. Monocystis agilis 1.25
PS–4. Coccidium oviforme from rabbit 1.25
PS–6. Malaria in blood 1.25

Class Infusoria

PI–1. Opalina ranarum from frog .. 1.25
PI–6. Didinium nasutum 1.25

PHYLUM PLATYHELMINTHES

Class Turbellaria

PT–3. Leptoplana tremellaris, E ... 1.00
PT–11. Fasciolaria hepatica, E 1.25
PT–13. Distomum lanceolatum, E ... 1.75
PT–17. Tristomum papillosum 1.75
PT–21. Gorgocera 1.50

Class Cestoda

PC–6. Moniezia expansa, sheep tapeworm, head $2.50
PC–11. Dipylidium caninum, scolex and segments 1.25

PHYLUM NEMATHELMINTHES

Class Nematoda

NN–6. Trichina spiralis in flesh .... .50
NN–8. Oxyurus vermicularis, male or female 1.00
NN–15. Uncinaria hookworm, male or or female 1.25

PHYLUM ARTHROPODA

Class Arachnida

Order Acarina (Mites)

AA–1. Acarus siro, cheese mite ... .75
AA–5. Demodex folicorum, face insect 1.50
AA–22. Sarcoptes scabei, male and female on one slide 1.25

Order Ixodoidea (Ticks)

A1–6. Margaropus annulatus, Texas fever tick 1.00

PARASITOLOGY SLIDES—continued

Class Hexapoda

Order Siphonaptera (Fleas)

HS–2. Ctenocephalus canis, dog flea $.50
HS–7. Pulex irritans, human flea, male or female 1.00
HS–9. Ceratophyllus fasciatus, rat flea ..... .50

Order Parasitica (Elliptoptera)

HE–1. Pediculus capitis (head louse) male or female ..... .50
HE–1a. Head louse eggs ..... .50
HE–7. Phthiris pubis, crab louse, male or female 1.00
HE–8. Crab louse, eggs ..... .75

Order Mallophaga

HM–10. Goniocotes, male or female from fowl ..... .50
HM–27. Trichodectes ..... .50

Order Diptera (Biting and Parasitic Flies)

HD–2. Aedes (Stegomyia) yellow fever mosquito, egg 1.00
HD–3. Aedes (Stegomyia) yellow fever mosquito, larva 1.50
HD–4. Aedes (Stegomyia) yellow fever mosquito, pupa 1.50
HD–5. Aedes (Stegomyia) yellow fever mosquito, head of male 1.50
HD–6. Aedes (Stegomyia) yellow fever mosquito, head of female 1.50
HD–7. Aedes (Stegomyia) yellow fever mosquito, E. male 2.00
HD–8. Aedes (Stegomyia) yellow fever mosquito, E. female ...$2.00
HD–9. Anopheles, malarial mosquito, eggs 1.25
HD–10. Anopheles, malarial mosquito, larva 1.00
HD–11. Anopheles, malarial mosquito pupa 1.00
HD–13. Anopheles, malarial mosquito, head of male 1.00
HD–14. Anopheles, malarial mosquito, head of female 1.00
HD–15. Anopheles, malarial mosquito, E. male 1.50
HD–16. Anopheles, malarial mosquito, E. female 1.00
HD–17. Culex pipiens, house mosquito, eggs ..... .50
HD–18. Culex pipiens, house mosquito, larva ..... .50
HD–19. Culex pipiens, house mosquito pupa ..... .50
HD–20. Culex pipiens, house mosquito, head of male ..... .75
HD–21. Culex pipiens, house mosquito, head of female ..... .75
HD–22. Culex pipiens, house mosquito, E. male 1.25
HD–23. Culex pipiens, house mosquito, E. female 1.25
HD–30. Glossina, tsetse fly E. 3.25

Order Hemiptera

HHe–1. Cimex lectularis, bed bug .. .50
HHe–2. Cimex lectularis, eggs ..... .50

E. BACTERIOLOGICAL SLIDES

PATHOGENIC ORGANISMS, PURE CULTURES EXCEPT AS NOTED

M–1. Actinomyces, lumpy jaw .... .60
M–4. Bacillus anthracis (Anthrax) .60
M–10. Bacterium (Bacillus) coli-communis ..... .60
M–11. Cornybacterium (Bacillus) diptheria ..... .60
M–16. Haemophilus (Bacillus) influenza ..... .60
M–32. Clostridium (Bacillus) tetani (lockjaw) ..... .60
M–34. Mycobacterium (Bacillus) tuberculosis ..... .60
M–41. Bacterium (Bacillus) typhosus .60
M–42. Bacterium typhosus, flagella stained 1.50
M–152. Neisseria (Gonoccoci) in urethral discharge (Gonorrhea) 1.00
M–47. Neisseria (Micrococcus) (catarrhalis ..... .60
M–50. Pneumococcus ..... .60
M–50a. Spirillum of asiatic cholera .. .60
M–53. Spirochaeta (Treponema) pallida (Syphilis) ..... .75
M–57. Staphylococcus aureus (boils) .60
M–60. Streptococcus pyogenes ..... .60

NON-PATHOGENIC

M–100. Bacterium (Bacillus) acidi lacti (Sour milk) ..... .60
M–113. Bacillus subtilis (hay) ..... .60
M–116. Saccharomyces (yeast) ..... .60
M–118. Sarcina lutea ..... .60
M–119. Spirillum rubrum ..... .60

F. DIATOMS, TEST PLATES, ETC.

DIATOMS SELECTED FOR TESTING MICROSCOPES

D–1. Amphipleura pellucida ..... .75
D–8. Pleurosigma angulatum ..... .75
D–12. Surirella gemma ..... .75
D–54. 8 forms with list 2.00
D–55. 15 forms with list 4.50

DIATOMS SELECTED FOR THE STUDY OF DIATOMS

D–49. 12 forms with list 1.75
D–50. 20 forms with list 2.50
D–52. 60 forms with list 5.00
D–53. 100 forms with list 7.50
D–13. Strewed slides each showing many species from various localities ..... .50

G. SETS OF SLIDES

DESIGNED FOR USE IN ELEMENTARY BIOLOGY COURSES

The slides included in these sets have been selected with regard to their teaching value. We have also aimed to make the sets suitable for use with all the common elementary text books and laboratory manuals. Because of the superior technique of our slides, we believe that these sets are particularly well adapted to the needs of beginning students, as all structures are clearly shown.

SS–1. Agriculture, set of 25 slides $10.00

Aspergillus, w.m.
Corn smut, sec.
Oat smut, sec.
Mildew, w.m.
Wheat rust, aecidial, sec.
Wheat rust, teleutospores, sec.
Wheat rust, uredospores, sec.
Penicillium
Dodder and host, sec.
Trichinella in muscle, sec.
Tapeworm proglottids
Corn seed, l.s. through embryo
Wheat seed, c.s.
Castor oil seed, c.s. showing food storage
Root tips, l.s. showing mitosis
Root tubercle of legume
Basswood, perennial dicot, c.s. & l.s.
Burdock, annual dicot stem, c.s.
Corn, monocot stem, c.s.
Lily anther, c.s.
Lily ovary, c.s.
Potato starch grains, w.m.
Cornstarch grains, w.m.
Epidermis of leaf, w.m. showing stomata
Typical leaf, c.s.

SS–2. Biology, set of 25 slides $10.00

Spirogyra, conjugating, w.m.
Yeast, budding, w.m.
Epidermis of leaf, w.m.
Typical leaf, c.s.
Corn stem, c.s.
Basswood stem, c.s.
Lily anther, c.s.
Lily ovary, c.s.
Paramecium
Hydra, w.m.
Mosquito head showing proboscis
Housefly mouth parts
Honey bee mouth parts
Cornea of compound eye, w.m.
Insect trachea, w.m.
Frog skin, pigment cells, w.m.
Frog blood
Human blood
Small intestine, c.s.
Bone c.s. and l.s.
Voluntary muscle, c.s. and l.s.
Retina, c.s.
Spinal cord, c.s.
Lung, sec.
Tongue, c.s.

SS–3. Botany, set of 25 slides $10.00

Spirogyra, conjugating, w.m.
Vaucheria fruiting, w.m.
Rhizopus, sporangia and zygospores
Mushroom gill, sec.
Yeast, budding, w.m.
Marchantia antheridia, l.s.
Marchantia archegonia, l.s.
Moss antheridia, l.s.
Moss archegonia, l.s.
Moss sporophyte, l.s.
Fern sporangia, sec.
Fern rhizome, c.s. and l.s.
Fern prothallium with young sporophyte, w.m.
Pine stem, c.s. and l.s.
Pine leaf, c.s.
Basswood stem, c.s. and l.s.
Burdock stem, c.s.
Corn stem, c.s.
Corn root, c.s.
Root tips, showing mitosis, l.s.
Lily anther, c.s.
Lily ovary, c.s.
Floral bud (lily) c.s.
Typical leaf, c.s.
Leaf epidermis, w.m.

SETS OF SLIDES—continued

SS–4. Physiology, set of 25 slides $10.00

Frog blood
Human blood
Lung, sec.
Bone, c.s. & l.s.
Elastic cartilage, sec.
Hyaline cartilage, sec.
Voluntary muscle, c.s. & l.s.
Involuntary muscle, c.s. & l.s. in the same tissue
Heart muscle, sec.
Small intestine, c.s.
Colon, c.s.
Stomach, c.s.
Trachea, c.s.
Pancreas, sec.
Spleen, c.s.
Liver, sec.
Salivary gland, sec.
Tongue, c.s.
Skin, c.s.
Cerebellum, sec.
Cerebrum, sec.
Spinal cord, c.s.
Kidney, c.s.
Nerve trunk, c.s.
Retina, c.s.

SS–5. Zoology, Elementary, set of 25 slides $10.00

Paramecium, w.m.
Grantia, c.s.
Grantia spicules, w.m.
Commercial sponge fibres, w.m.
Hydra, w.m.
Hydra, budding, w.m.
Hydra, c.s.
Obelia, hydroid, w.m.
Planaria, w.m.
Tapeworm proglottids, w.m.
Trichinella in muscle, sec.
Earthworm, c.s. behind clitellum
Starfish ray, c.s.
Clam gill, c.s.
Cornea of compound eye, w.m.
Butterfly wing showing scales
Insect trachea
Mosquito larva
Fly proboscis
Bee mouth parts
Bee sting
Fish scale
Frog blood
Frog skin, w.m. showing pigment cells
Frog skin, c. s. showing glands

SS–6. Zoology, advanced, set of 25 slides $12.50

(Especially adapted for Hyman's Manual.)

Paramecium, conjugation
Paramecium, fission
Hydra, c.s.
Hydra, budding
Obelia, colony, w.m.
Planaria, c.s. thru anterior, middle, and posterior regions
Planaria, w.m. showing digestive system
Earthworm, c.s.
Starfish eggs, unsegmented, w.m.
Starfish eggs, cleavage and blastula, w.m.
Starfish eggs, gastrula, w.m.
Frog egg, blastula, sec.
Frog egg, circular blastopore (yolk plug) sec.
Frog larva, neural tube stage, c.s.
Frog liver, sec.
Frog stomach, c.s.
Frog kidney, c.s.
Frog skin, c.s.
Frog blood
Frog small intestine, c.s.
Bone (cat femur) c.s.
Hyaline cartilage, sec.
Spinal cord, cat, c.s.
Cerebrum, Golgi stain, cat
Root tips, l.s. showing mitosis

SS–7. Bacteriology, set of 12 slides $5.00

Since bacteria are exceedingly minute organisms, an oil immersion lens is desirable for the study of most of them. However, a 4 mm. objective and a 10x ocular will give a fairly adequate idea of many forms. In examining them, use as bright an illumination as possible (but never direct sunlight) and employ a microscope with a substage condenser if it is available. A condenser is absolutely necessary with oil immersion lenses.

Azotobacter
Bac. acidi lactici
Bac. coli
Bac. diphtheriae
Bac. influenzae
Bac. subtilis
Bac. tetani
Bac. tuberculosis, human
Bac. typhosus
Staphylococcus albus
Streptococcus haemoliticus
Spirillum rubrum

ANATOMY OF COMMON WOODS
CUTS OF WOOD SLIDES

Set No. BS5. 12 Slides. 36 Sections in case, prepaid $10.00

These slides have been prepared by the most improved celloidin methods, which insure perfect preservation of the form and relation of cells, and which also makes possible an unusually brilliant and durable stain. The sections are all very thin and perfectly adapted to study with the highest power objectives, as well as for use in photo-micrography and micro-projection. The sections are from 7.5 to 10 microns in thickness. Each set is accompanied by a completely illustrated text or syllabus, giving full description and photo-micrograph half-tone of each section. Thirty-six in all (Extra copies of Booklet twenty-five cents each.)

1 Larch
2 Red Wood
3 Red Cedar
4 Black Walnut
5 White Hickory
6 Red Oak
7 White Elm
8 Black Locust
9 Mahogany
10 Red Maple
11 Basswood
12 White Ash

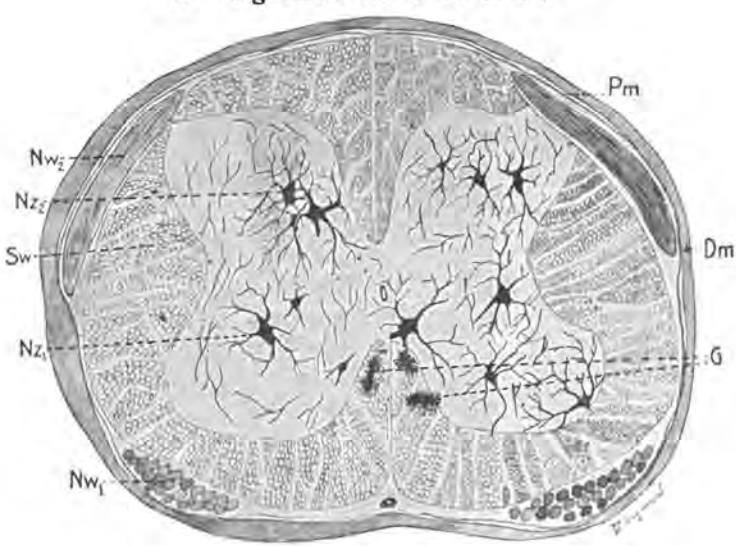
(Sold in complete sets only)

Each slide is of the highest quality and includes three sections; radial, tangential and transverse. Sets will be sent subject to examination and approval.

H. SIGMUND SLIDES

These are in our opinion the finest series of slides available for teaching purposes. They are carried in stock and we are always glad to mail them for examination to those interested in receiving a set, as we have done this in the past and have never had a set returned after examination. There are at present 4 sets available.

PHYSIOLOGICAL HISTOLOGY
Of Man and Mammalian Animals by Fr. Sigmund and C. L. Evans



Transverse Section of Spinal cord of Cat

(Golgi's silver impregnation method)

Dm = Dura mater of cord. Pm = Pia mater of cord. Nz_1 = Nerve cells of anterior horn, with processes. Nz_2 = Nerve cells of posterior horn, with processes. Nw_1 = Anterior nerve roots in transverse section. Nw_2 = Posterior nerve roots in longitudinal section. Sw = Nerve fibres of white matter in cross section. G = Neuroglia (connective) cells of the nerve tissue. (Magnification about 50 lin.)

We have secured American rights for distributing Prof. Sigmund's Physiological Histology, and take pleasure in recommending it to your attention. This work consists of a series of carefully selected and finely prepared **Microscope Slides,** together with a clearly written **text** illustrated by numerous accurate **drawings.** Here are brought together for the first time these three parts needed for a proper treatment of the subject.

There are already on the market many excellent treatises and text books on histology, which describe in great detail the various processes (e.g. fertilization, cell division and growth, blood formation, etc.), but knowledge derived from description and cuts alone invariably fails to give the results obtained by consideration of the actual objects and observing through their examination their biological significance, and so microscope slides have been demanded; for while drawings are especially faulty, in that they defy further resolution, turning under the lens into colored dots and lines of no significance, the real object offers at each new magnification fresh revelations and finer details. But heretofore the slides, text and cuts were not prepared under the direction of one person and so failed to give the highest result.

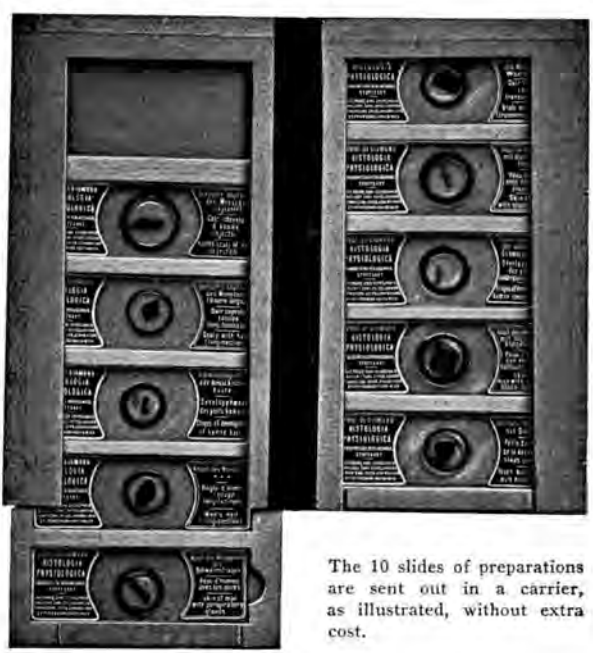
Prof. Sigmund recognized this and has used the greatest care, first in the choice of preparations and their execution, secondly in having the text properly describe what may be learned by their examination, and thirdly in illustrations which direct attention to the most important features. Now for the first time are offered in convenient form

Original Preparation, Description and **Illustration.**

Those who know the difficulty of preparing specimens, especially by section method, the scarcity of good material, the pitfalls of the various staining methods, and the expense connected with all these, will welcome this chance of securing at a very low price exceptional preparations.

Special attention is drawn to the preparations of the Central Nervous System and the Organs of Special Sense, according to the methods of Golgi, Ramon y Cajal, and Weigert, and to those of the nerve endings for which the Gold Methods are used. Such preparations are offered for sale in quantity for the first time, having hitherto been hard to secure and expensive to purchase ($1.00 to $2.00 each).

The preparations illustrate the cellular arrangement, blood supply, innervation, and development of the various organs. Our interest is thus directed to the actual observation of cell forms and of the phenomena of cell life, upon which so many scientific minds are only informed by means of schematic drawings; for example the structure of the central nervous system and of the organs of special sense, the processes of maturation of the ovum, of spermatogenesis, of fertilisation, the earlier stages of development, the origin and fate of the blood corpuscles, &c.



The 10 slides of preparations are sent out in a carrier, as illustrated, without extra cost.

Part I. The skin and cutaneous organs and their development, contains the following preparations:

Progressive development of human hair
Scalp with hair (inject.)
Scalp with hair (long. section)
Scalp with hair (transv. section)
Palpicils of an ox with blood-sinus
Skin of man with injected blood vessels
Skin of man with perspiratory glands
Skin of dog with elastic fibres
Man's nail (long. section)
Progressive development of the human perspiratory glands

Part II. Organs of movement (muscles, tendons, bone, cartilage and joints), as follows:

Joint of the rabbit (median section)
Embryonic finger of man (long. section)
Injected muscle of the dog (long. section)
Bone of ox (transv. section)
Embryonic arm of man (transv. section)
Muscle of the dog (transv. section)
Cranial bone of dog
Muscle of ring-snake with motor nerve-plates
Cervical ligament of ox

Part III. The Central Nervous System (brain, spinal cord and spinal ganglia), as follows:

Spinal cord and spinal ganglion of the cat
Pineal ganglion of neat (transv. section)
Cerebral cortex of the cat (cell-impregn.)
Embryonic spinal cord of the fowl
Spinal cord of the dog (cell-pigment)
Cerebellum of cat (fibre impregn.)
Embryo of the rabbit (transv. section)
Spinal cord of the cat (cell-impregn.)
Cerebrum of man (fibre pigment)
Pituitary gland of ox (transv. section)

Part IV. Reproductive Organs, as follows:

Oviduct of the bitch (transv. sect.)
Mammary gland of the neat
Testicles of the mouse (transv. sect.)
Ovary of the bitch (transv. sect.)
Penis of the bull (transv. sect.)
Navel string of man (transv. sect.)
Gravid uterus of the pig (transv. sect.)
Glandula vesicularis of the bull
Ovary of a new-born child (transv. sect.)
Sperms of a bull

Part V. Respiratory and Urinary Organs, as follows:

Urinary bladder of the neat (transv. sect.)
Kidney of the mouse (transv. sect.)
Embryonic Okenian body of the dog (transv. sect.)
Suprarenal capsule of the neat (transv. sect.)
Thyroid gland of man
Trachea of the cat (transv. sect.)
Lights of the dog (cell-pigment)
Lights of the cat (injected)
Lights of the cat (elastic fibres)
Kidney of the rabbit (injected)

Part VI. The Eye and its accessories, as follows:

Embryonic eye of hog (median sect.)
Interior half of eye of neat, without lens (horizontal sect.)
Eyelid of calf (medial sect.)
Optic nerve of ox (median sect.)
Cornea of neat (Gold impregnation)
Choroid of neat, showing pigment cells
Eye of embryo chick (medial sect.)
Retina of ox (cell stained)
Glands of nictitating membrane of rabbit
Lachrymal gland of ox

Part VII. The Organs of Hearing, Smell, Taste and Touch:

1. Auditory organ of cat (membrana tympani)
2. Cochlea of cat (medial section)
3. Ear of cat—Sensory hairs of ampullae
4. Auditory vesicle of embryo rabbit
5. Nasal mucous membrane of cat, T. S.
6. Nasal mucous membrane (respiratory portion) of rabbit
7. Olfactory mucous membrane of rabbit
8. Circumvallate papillae of ox
9. Papilla foliata of rabbit
10. Pacinian corpuscles of human skin

Part VIII. The Circulatory and Blood-forming Organs:

1. Cardiac muscle—human
2. Transverse section of rabbit embryo, through region of heart
3. Transverse section of renal artery and vein of pig (cells stained)
4 Transverse section of renal artery and vein of pig (fibres stained)
5. Human blood—film preparation
6. Haemin crystals of human blood
7. Red bone marrow of pig
8. Human spleen
9. Lymph glands of pig
10. Thymus gland of child

Part IX. The Digestive Organs (I).

1. Tongue of cat
2. Human lip, transverse section
3. Developing tooth of pig
4. Developing tooth of dog
5. Sub-lingual gland of sheep
6. Esophagus of rabbit
7. Stomach of dog, transverse section
8. First stomach (paunch) and reticular stomach of calf
9. Small intestine of child, T. S.
10. Duodenum of pig, T. S.

Part X. The Digestive System (II).

1. Small intestine of dog—Blood vessels injected
2. Small intestine of rabbit—injected
3. Nerve plexus in small intestine of rabbit
4. Caecum of rabbit, T. S.
5. Pancreas of pig
6. Liver of rabbit—injected
7. Human liver, showing cells
8. Liver of rabbit—Bile capillaries impregnated
9. Transverse section of embryo of pig, in region of liver
10. Rectum of pig, T. S.

Price complete set of 10 parts $62.50
Individual parts 7.00

COMPARATIVE HISTOLOGY OF VERTEBRATE ANIMALS FIVE PARTS, OF THE FOLLOWING GENERAL CONTENT:

Part 1. Amphioxus, Cyclostomata and Selachia.
Part 2. Bony Fishes (Teleostei).
Part 3. Amphibia and their development.
Part 4. Structure and development of reptiles. (Sections of jaws, brain, auditory organ, eye, testis and skin of lizard, blindworm, and snake.)
Part 5. Structure and development of birds. (Sections of cerebellum, gizzard, stomach, eye, fat gland, kidney, various stages of feather formation, and transverse sections of embryos).

EACH PART CONSISTS OF:

1. A Case of Microscopic Preparations (10) on 26 x 76 mm slides, each suitably labelled.
2. Explanatory text, with Black and White illustrations after the author's original drawings.

Complete set of 5 parts $31.25
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THE GENERAL ANATOMY OF THE INVERTEBRATA COMPRISES TEN SEPARATE PARTS WITH THE FOLLOWING CONTENTS:

PARTS 1 & 2. Anatomy of the Shell-fish (Mollusca illustrated by sections through the fresh-water mussel, the Roman snail, and **Allothentis subulata.** As an appendix, the structure of the Ascidians (Sea-squirts) (Tunicata; **Botryllus, Ascidia).**

PARTS 3 & 4. Anatomy of the Arthropoda with special reference to the Insects, Spiders and Crustacea.

PARTS 5 & 6. Anatomy of the Worms illustrated by sections through the earthworm, thread worm, leech, tapeworm, **Sagitta,** the common sandworm, **Spirographis Spalanzanii, Distomum lanceolatum** and **Trichina.** As an appendix the anatomical structure of the Polyzoa (Bryozoa).

PART 7. Anatomy of the Echinodermata. Sections through the sea-urchin, starfish and sea-cucumber **(Holothuria).**

PARTS 8 & 9. Anatomy and alternation of generations of the Coelenterata (Cnidaria) and the Sponges (Porifera).

PART 10. The Protozoa; various free-living and parasitic forms.

EACH PART CONSISTS OF:

1. A folder with 10 microscopial preparations, ready for use and mounted on glass slides 3″ x 1″ (26 x 76 mm). Each slide is splendidly finished and carefully labelled.
2. A text brochure illustrated with numerous black and white text-figures after original drawings by the editor.

Complete set of 10 parts $62.50
Single parts 7.00

ANATOMY AND DEVELOPMENT OF THE PHANEROGAMS
100 SLIDES WITH TEXTS BY DR. SIGMUND

In the teaching of Botany, there is a growing tendency nowadays for more stress to be laid on microscopical structure and on the histological changes which take place in the course of development; relationships between the various classes of plants can also be well illustrated by means of the microscope. But with this advance in the teaching of the subject there are also changes in the methods available for the preparation and staining of sections of plant material for microscopic examination—the old hand-cut and unstained preparation are being fast replaced by microtome-made sections of fixed tissues stained by permanent methods, such as have been long in use in the investigation of the structure of animal tissues. Teachers of Botany who have not the means and time at their disposal for the manufacture of these preparations will welcome the advent of a series of slides prepared by a lifelong expert for the express purpose of illustrating

THE TYPICAL STRUCTURE OF THE CHIEF CLASSES OF PLANTS

The preparations are stained by permanent dyes, and where possible differential staining of the various plant tissues has been accomplished (e. g. lignified and unlignified cell walls, nuclei, protoplasm, etc.).

THE STAGES OF DEVELOPMENT ARE ILLUSTRATED IN THE SERIES ALSO

Since these throw such an important light on the structure of the mature plant forms. Thus, the change from the growing point of the stem to the green twig, and finally to the woody stem are illustrated by appropriate slides. Special attention is also given to the preparations showing

THE STRUCTURE OF BUDS, FORMATION OF POLLEN, EMBRYONIC DEVELOPMENT, ETC.

These preparations are of real scientific value. They will be especially useful to those TEACHERS who have not the facilities at their disposal for making microscope slides; also to STUDENTS attending courses of Botany at Universities and Colleges, where the instructional courses do not allow sufficient time for the preparation of slides of permanent value.

THE WORK COMPRISES 10 PARTS, AS FOLLOWS:

PART 1. General Anatomy of Phanerogams. This part forms a selfcontained portion of the work, in which preparations for the illustration of the structure of the chief classes of plant tissues are selected from the remaining parts of the work.

PART 2. Structure of Stems of Phanerogams. Transverse and longitudinal sections.

PART 3. Structure of the stems of Conifers, Monocotyledons, and Dicotyledons, green, and lignified. Structure of Primary and Secondary Cortex, Cork, Bark.

PART 4. Roots of Conifers, Monocotyledons, and Dicotyledons. Origin of vessels.

PART 5. Roots showing secondary thickening, aerial and parasitic roots, root symbiosis, Statoliths, etc.

PART 6. The Leaf. Leaves of Conifers, Monocotyledons, Dicotyledons. Leaves of light and shade, aquatic and xerophytic plants. Fall of leaves.

PART 7. The Structure of Buds.

PART 8. The Embryo-sac, and Fertilisation.

PART 9. The Structure and Development of Pollen.

PART 10. Seeds: their structure, formation and germination.

Complete set of 10 parts $62.50
Single parts 7.00

I. MICROSCOPE SLIDES OF THRIPS

THE GENERA OF THE THRIPS

Through the courtesy of Prof. Hood of the University of Rochester we are able to offer sets of slides representing the different genera of the thrips. The identifications have in every case been checked by Prof. Hood himself.

Each species is mounted most carefully for examination under the microscope, and the characteristics of the genus are well shown by the species selected, which as far as the material on hand permitted, are genotypes. We know that these sets fill a great need, as the classification of the thrips has for a long time been in an unsatisfactory condition.

The number of sets available is limited, so we would suggest that if you are interested you send us your order at as early a date as possible, to make sure of securing one of them.

A photographic enlargement of one of the slides

Genus and species	*Family*
*Aeolothrips fasciatus (Linne)	Aeolothripidæ
*Heterothrips arisæmæ (Hood)	Heterothripidæ
*Chirothrips manicatus (Haliday)	Thripidæ
Limothrips denticornis (Haliday)	Thripidæ
Frankliniella tritici (Fitch)	Thripidæ
*Aptinothrips rufus (Gmelin)	Thripidæ
*Heliothrips hæmorrhoidalis (Bouche)	Thripidæ
*Parthenothrips dracænæ (Heeger)	Thripidæ
*Anaphothrips obscurus (Muller)	Thripidæ
Thrips tabaci (Lindemann)	Thripidæ
*Ctenothrips budwelli (Franklin)	Thripidæ
Tæniothrips inconsequens (Uzel)	Thripidæ
*Salenothrips rubrocinctus (Giard)	Thripidæ
Haplothrips leucanthemi (Schrank)	Phlæothripidæ
Trichothrips angusticeps (Hood)	Phlæothripidæ
Hoplothrips major (Hood)	Phlæothripidæ
Cryptothrips rectangularis (Hood)	Phlæothripidæ
Zygothrips americanus (Hood)	Phlæothripidæ
*Neothrips corticis (Hood)	Phlæothripidæ
*Neurothrips magnafemoralis (Hinds)	Phlæothripidæ
*Megalothrips spinosus (Hood)	Phlæothripidæ
Liothrips citricornis (Hood)	Phlæothripidæ
*Rhynchothrips primi (Hood)	Phlæothripidæ
*Bagnalliella yuccæ (Hinds)	Phlæothripidæ
Elaphrothrips tuberculatus (Hood)	Idolothripidæ

*—genotype.

Set of 10 slides—$15.00
Set of 15 slides— 25.00
Set of 20 slides— 40.00
Set of 25 slides—50.00

ECONOMIC SPECIES OF THYSANOPTERA

Prof. Hood has also prepared for us a few sets of the Thrips of economic importance. These sets of eleven slides each include all but one, the Orange Thrip—Scirtotrips citri (Moulton)—of the North American Thrips which are known to be of economic importance.

Set of eleven slides as above—$20.00

SECTION VIII.
PALEONTOLOGY (Fossils)

917 241 358

From Circular No. 115

A. COLLECTIONS

What is a fossil? Dr. Shimer answers "a fossil is the remains of a plant or animal, or the record of its presence, preserved in the rocks of the earth."

We have prepared a collection illustrating the usual forms that are covered by this definition.

Pal. No. 1. Fossilization collection $15.00

The Collection contains:

I. FOSSILIZED REMAINS OF ORGANISMS

(A) Unaltered remains, examples:

1. Insect in Amber
2. Bone of Fossil mammal (Oreodon)
3. Molluscan shell from Tertiary

(B) Altered remains (Petrifactions):

(a) Altered through silicification, examples:

4. Wood from petrified forest of Arizona
5. Shell turned to Opal from Australia

(b) Altered through calcification, examples:

6. Devonian Coral
7. Palaeozoic brachiopod

(c) Altered through pyritization, example:

8. A pyritized cephalopod mollusc

(d) Altered through carbonization, example:

9. Leaf in Clay iron stone

II. OBJECTS INDICATING THE FORMER PRESENCE OF ORGANISMS

(A) Molds, external and internal, examples:

10. Internal cast of a gastropod mollusc
11. Footprint of Permian Amphibian
12. Worm burrow

(B) Coprolites:

13. Fossil coprolite

(C) Artificial structures, example:

14. Prehistoric flint flakes

Pal. No. 2. A collection prepared for use with Dr. Shimer's book "An Introduction to the study of Fossils." The aim of this collection is to show by means of specimens, models and microscope slides the characteristics of the major divisions of the animal kingdom. In other words it is a collection to aid in the teaching of systematic zoology. It contains the following:

Phylum I. Protozoa

1.	Fusulina in carboniferous rock	$ .25
2.	Strewed slide of various foraminifera	.75
3.	Strewed slide of various radiolaria	.75

Phylum II. Porifera

Class Calcarea

4.	Microscope slide showing L.S. and T.S. of Grantia	.75
5.	Eudea lagenaria, a Jurassic Calcareous sponge	.25

Class Non-Calcarea

6.	Euplectella, a recent silicious sponge	5.00
7.	Hydnoceras, a somewhat similar Devonian sponge	1.50
8.	Recent Commercial Sponge	.50

Phylum III. Coelenterata

Class Hydrozoa (Hydroids)

9.	Microscope slide of hydroid colony	.50
10.	Ordovician Graptolite	1.00
11.	Stromatopora, a palaeozoic hydrocoral	.75

Class Scyphozoa (Jelly fish)

12.	Aurelia, a recent jelly fish in glass jar	2.00
13.	Brooksella alternata, a Cambrian jelly fish	3.00

Class Anthozoa (Corals)

14.	Astrangia, a modern coral with polyps preserved, and mounted in glass jar	1.50
15.	Heliophyllum, a Devonian tetracoral	.50
16.	Madrepora, a recent hexacoral	.50
17.	Tubipora musica, a recent octocoral	1.00
18.	Favosites, a Devonian tabulate coral	.50

Phyla IV, Platyhelminthes. V, Nemathelminthes. VI, Trochelminthes.

Unknown in fossil state so examples are not given here

Phylum VII. Annulata (Ringed Worms)

19.	Nereis, the clam worm in glass jar	1.00
20.	Spirorbis, fossil	.50

Phylum VIII. Echinodermata

Class Cystoidea

21.	Caryocrinus, a Silurian cystid	1.00

Class Blastoidea

22.	Pentremites, a Mississippian blastoid	.50

Class Crinoidea

23.	Antedon, a recent crinoid in glass jar	3.50
24.	Platycrinus, a Mississippian crinoid	1.50

Class Asteroidea

25.	A recent Starfish, dry	.50

Class Ophiuroidea

26.	Devonian serpent star	2.50

Class Echinoidea

27.	Test of Cidaris, Recent	.50
28.	Cretaceous Sea urchin	.50

Phylum IX. Molluscoidea

Class Bryozoa

29. Microscope slide of Bugula ..... $.50
30. Membranipora, a recent Bryozoan ..... .50
31. Monticulipora, a Palaeozoic Bryozoan ..... .50

Class Brachiopoda

32. A recent Brachiopod with animal in shell, one side cut away, in glass jar ... 2.50
33. Lingula, a recent brachiopod ..... .75
34. Strophomena, Ordovician ..... .25
35. Productus, Pennsylvanian ..... .25
36. Platystrophia, Ordovician ..... .25
37. Rhynchotrema capax, Ordovician ..... .25
38. Atrypa reticularis, Devonian ..... .25
39. Spirifer mucronata, Devonian ..... .25

Phylum X. Mollusca

Class Amphineura

40. Chiton, shell dry ..... .50

Class Pelecypoda

41. Venus mercenaria, shell dry ..... .50
42. Nucula proxima, Miocene ..... .25
43. Inoceramus barabini, Cretaceous ..... .75
44. Ostraea, a fossil oyster from Eocene ..... .50
45. Exogyra arietina, Cretaceous ..... .50
46. Unio gibbosus, River mussel, Recent ..... .25
47. Pecten, Scallop shell, Recent ..... .50

Class Gastropoda

48. Busycon canaliculatus, shell sectioned 1.00
49. Pleurotomaria from Jurassic ..... .50
50. Fissurella, a recent volcano shell ..... .50
51. Turritella, a recent shell and a fossil internal cast 1.00
52. Microscope slide of recent pteropod 1.00
53. Tentaculites, a fossil pteropod ..... .50
54. Polygyra albolabris, a recent land snail with animal expanded in glass jar 1.25

Class Scaphopoda, the tooth shell

55. Dentalium from Oligocene ..... .25

Class Cephalopoda

56. Loligo, the squid in glass jar 2.00
57. Nautilus pompilius, ½ of shell showing septa 2.50
58. Orthoceras, a palaeozoic straight form ..... .75
59. Muensteroceras oweni, a Goniatite from the Mississippian 2.50
60. Ceratites, Ceratite from the Triassic 2.50
61. Scaphites, an Ammonite from the Cretaceous 1.50
62. Baculites, a straight Ammonite, Cretaceous ..... .75
63. Belemnites, a Belemnite from the Jurassic ..... .50

Phylum XI. Arthropoda

Class Crustacea

Subclass Trilobita

64. Complete restoration after Beecher of Triarthrus becki 7.50
65. Calymene meeki, Ordovician 2.00
66. Phacops schlotheimi, Devonian 2.00

Subclass Ostracoda

67. Fossil Ostracod shells from Silurian ..... .50

Subclass Cirripedia, The Barnacles

68. Balanus with animal in glass jar 1.00

Subclass Malacostraca

69. Fossil crab from the Lithographic limestone of Solenhofen 2.00
70. Cambarus mounted dry in glass top box 1.00

Phylum Arthropoda (continued)

Subclass Arachnida

71. Limulus, the king crab, a small specimen in glass top box $1.50
72. Restoration of Belinurus, Carbonic 2.50

Class Insecta

73. Fossil insect in shale, Oligocene 1.00
74. Fossil insect in amber, Eocene 2.50
75. Recent Butterfly, Beetle, Dragon-fly and Honey Bee mounted together in Riker Mount 2.00

Phylum XII. Chordata

Class Pisces

76. Fossil Fish from the lithographic limestone of Solenhofen, Jurassic 2.00
77. Teeth of large fossil shark, Eocene 1.00

Class Amphibia

78. Head only of Permian Amphibian 5.00
79. Salamander in glass jar 2.00

Class Reptilia

80. American Chameleon in glass jar 2.00

Class Aves

81. Skeleton of wing of pigeon 2.50
82. Skull of pigeon 2.00

Class Mammalia

83. Skull of cat 2.50
84. Fossil of bone of Oreodon, Oligocene 1.00
85. Cast of Cranium of the Neanderthal Man 2.50

Complete collection as above amounting to $109.00, packing $5.00 extra, will be supplied F. O. B. Rochester, N. Y. for the sum of $100.00

Pal. No. 3. A larger collection which has been approved by Dr. Shimer for use with his book, including dissections and enlarged anatomical model, a typewritten list of which we are glad to furnish $710.00

Pal. No. 4. Collection of Recent and Fossil Invertebrates. This collection consists of 125 specimens, 47 recent forms and 78 fossils, each specimen is mounted on a hard-wood block with bevelled edge, the label being attached to the bevelled edge. The specimens are of good size and quality, a very good collection for exhibition $100.00

N.B.—For complete list of this collection Pal. 4 write for circular No. 232.

Pal. No. 4a. Collection similar to No. 4 but the specimens are somewhat smaller and are furnished in trays instead of on hardwood blocks $65.00

Pal. No. 5. Collection of Fossil and Recent invertebrates containing 250 species mounted on hardwood blocks with label $250.00

Pal. No. 6. Student collection of Fossil and Recent animals, 40 specimens in trays in pasteboard box with label in cover. This collection is made up of the following:

Protozoa		Coelenterata	
1. Nummulites	Fossil	6. Heliophyllum	Fossil
2. Orbitolites	Recent	7. Favosites	Fossil
		8. Halysites	Fossil
Porifera		9. Oculina	Fossil
3. Caryomanon	Fossil	10. Madrepora	Recent
4. Sycon	Recent	11. Distichopora	Recent
5. Spongia	Recent	12. Sea pansy	Recent

Echinodermata

13.	Pentremites	Fossil
14.	Crinoid	Fossil
15.	Starfish	Recent
16.	Sea urchin, test	Recent
17.	Sand Dollar	Recent

Molluscoidea

18.	Bryozoan	Fossil
19.	Bryozoan	Recent
20.	Lingula	Recent
21.	Rafinesquina	Fossil
22.	Platystrophia	Fossil
23.	Atrypa	Fossil
24.	Spirifer	Fossil

Mollusca

25.	Cucullaea	Fossil
26.	Arca	Recent
27.	Venericardia	Fossil
28.	Venus	Recent
29.	Chiton	Recent
30.	Platyceras	Fossil
31.	Trepospira	Fossil
32.	Strombus	Recent
33.	Ammonite	Fossil

Arthropoda

34.	Trilobite	Fossil
35.	Barnacle	Recent
36.	Crustacean	Fossil
37.	Insect in shale	Fossil

Vertebrata

38.	Shark's tooth	Fossil
39.	Part of skull of Mammal	Fossil
40.	Skull of muskrat	Recent

Single collection $15.00
Lots of 12 or more, each 10.00

Pal. No. 7. Stratigraphic collection of Fossils containing one hundred and ninety species represented by 256 fossils and 19 colored casts divided as follows:

Pre-Cambrian	1 species	Permian	4 species
Cambrian	5 species	Triassic	9 species
Ordovician	20 species	Jurassic	22 species
Silurian	20 species	Cretaceous	24 species
Devonian	20 species	Eocene	21 species
Carboniferous	22 species	Neocene	22 species

Each species is furnished in a tray on a block with label giving species, formation and locality. Price $100.00

N.B.—For full description of this collection write for circular No. 115.

Pal. No. 8. Student Stratigraphic collection containing 40 species in trays in pasteboard box with label in cover. The collection contains:

Ordovician

1. Sponge, 2. Graptolite, 3. Coral, 4. Bryozoan, 5 & 6. Brachiopods, 7. Cephalopod.

Silurian

8. Graptolite, 9. Coral, 10 & 11. Brachiopods.

Devonian

12 & 13. Corals, 14 & 15. Brachiopods, 16. Gastropod, 17. Trilobite.

Carboniferous

18. Coal Plant, 19. Coral, 20. Crinoid, 21. Blastoid, 22. Brachiopod.

Jurassic

23. Sponge, 24 & 25. Brachiopods, 26. Pelecypod, 27 & 28. Cephalopods.

Cretaceous

29. Plant, 30. Brachiopod, 31. Pelecypod, 32. Cephalopod.

Eocene

33. Pelecypod, 34 & 35. Gastropods, 36. Shark's tooth.

Neocene

37 & 38. Pelecypods, 39. Gastropod, 40. Vertebrate bone.

Single collections $6.00
In lots of 12 or more 4.50

Pal. No. 9. Collection illustrating the evolution of the Cephalopods:

1. Orthocone, 2. Cyrtocone, 3. Gyrocone, 4. Nautiloid, 5. Gomphocone, 6. Goniatite, 7. Ceratite, 8. Ammonite.

The specimens are selected to show the sutures plainly $20.00

Pal. No. 10. Collection of Brachiopoda containing 40 genera in trays in pasteboard box with label in cover $20.00

N.B.—Other special collections made up upon request.

B. PALEONTOLOGICAL SPECIMENS

Our stock of fossils includes many thousands of specimens. Covering these we have many typewritten lists, arranged both according to formation and according to phyla. We are glad to send these or to prepare special lists to meet the needs of our customers.

From our large stock we list here a few index fossils, and recent types for comparison with them.

Heliophylum

Lithostrotion

PROTOZOA

	per set	per doz.
Endothyra baleyi—Miss., ... set of 5	$ .25	$2.00
Fusulina secalica—Carb., ... set of 5	.25	2.00
Nodosaria—Cret. ... set of 3	.25	2.00
Idalina—Cret. ..... set of 4	.25	2.00
Lacazina—Cret. .... set of 4	.25	2.00
Orbitolina—Cret. ... set of 4	.25	2.00
Nummulites (large)—Eocene ..... set of 2	.25	2.00
Nummulites (small)—Eocene ..... set of 6	.25	2.00
Operculina—Eocene set of 2	.25	2.00
Lepidocyclina—Oligocene ..... set of 5	$ .25	$2.00
Quinqueloculina—Pliocene ..... set of 4	.25	2.00
Robulina—Pliocene ..... set of 4	.25	2.00
Orbitolites—Recent ..... set of 4	.25	2.00
Microscope slide of 12 species of Foraminifera, each		2.50
Microscope slide of 25 species of Foraminifera, each		3.50

PORIFERA

	Seltd. spec. each	Aver. spec. per doz.
Saccospongia—Ord.	$ .40	$3.00
Receptaculites—Ord.	.75	4.00
"Astylospongia"—Sil.	.50	3.00
Astraeospongia—Sil.	.75	5.00
Hydnoceras—Dev.	$1.50	$6.00
Eudea—Jura	.25	1.00
Euplectella—Recent	4.00	
Spongia dura—Recent		.75

COELENTERATA

Diplograptus—Ord.	.75	4.00
Phyllograptus—Ord.	1.00	6.00
Tetragraptus—Ord.	1.00	6.00
Monograptus—Sil.	.75	3.00
Streptelasma—Ord.	.50	2.00
Columnaria—Ord.	1.00	3.00
Protarea—Ord.	.25	2.00
Stylaraea—Ord.	1.50	3.00
Lamotia—Ord	1.00	6.00
Tetradium—Ord.	.50	3.00
Duncanella—Sil.	.25	1.50
Enterolasma—Sil.	.25	1.50
Charactophyllum—Sil.	.25	2.00
Heliolites—Sil.	.50	2.00
Cladopora—Sil.	1.00	2.00
Thecia—Sil.	.50	2.00
Favosites—Sil.	.50	
Palaeocyclas—Sil.	.50	2.50
Aulacophyllum—Dev.	.50	2.00
Blothophyllum—Dev.	.50	2.50
Calceola—Dev.	.75	3.00
Craspidophyllum—Dev.	1.00	1.00
Cystiphyllum—Dev.	1.00	3.00
Enterolasma—Dev.	.25	2.00
Heliophyllum—Dev.	.50	2.00
Hadrophyllum—Dev.	.25	2.00
Charactophyllum—Dev.	.50	3.00
Pachyphyllum—Dev.	1.00	4.00
Synaptophyllum—Dev.	1.00	3.00
Zaphrentis (Canina)—Dev. ..	.50	2.50

COELENTERATA (continued)

	Seltd. spec. each	Aver. spec. per doz.
Alveolites—Dev.	$ .75	$2.00
Cladopora—Dev.	.50	1.00
Favosites—Dev.	1.00	1.50
Michelinia—Dev.	1.00	2.50
Pleurodictyum—Dev.	.50	3.00
Striatopora—Dev.	1.00	3.00
Cyaxonia—Miss.	.25	1.00
Hapsiphyllum—Miss.	.25	1.00
Cystelasma—Miss.	.25	1.00
Lithostrotion—Miss.	2.00	3.00
Triplophyllum—Miss.	.25	1.00
Campophyllum torquim—Carb	.40	3.00
Lophophyllum—Carb.	.25	2.00
Thecosmilia—Jura	.50	4.00
Parasmilia—Cret.	.50	2.50
Astrocoenia—Cret.	.25	2.00
Calamophyllia—Cret.	.25	1.00
Cyclolites—Cret.	$ .50	$1.50
Phyllocoenia—Cret.	.25	1.50
Pleurocora—Cret.	.25	.75
Synastraea—Cret.	.25	2.00
Trochosmilia—Cret.		.75
Coenangia—Eocene		.50
Platytrochus—Eocene		.75
Turbinolia—Eocene		.50
Oculina—Oligocene	.25	2.00
Ceratotrochus—Miocene		.75
Solenastraea—Pliocene	1.00	3.00
Madrepora—Recent	2.00	2.00
Pocillopora—Recent	.50	2.00
Dichocoenia—Recent	1.00	4.00
Orbicella—Recent	1.00	3.00
Fungia—Recent	1.00	3.00
Porites—Recent	1.00	3.00

ECHINODERMATA

Cystoidea

Caryocrinus—Sil.	1.00	6.00
Sphaerocystites—Sil.	2.00	8.00

Blastoidea

Pentremites—Miss.	.25	.50

Crinoidea

Ectenocrinus—Ord.	.75	2.00
Glyptocrinus—Ord.	.75	3.00
Eucalyptocrinus (internal casts) Sil.	.50	
Habrocrinus (internal casts)—Sil.	.50	3.00
Pisocrinus (small calyx)—Sil.	.25	1.00
Stephanocrinus (small calyx)—Sil.	.50	3.00
Cupressocrinus (calyx)—Dev.	3.00	12.00
Gennaeocrinus (calyx)—Dev.	3.00	12.00
Haplocrinus (calyx)—Dev.	.25	1.50
Hexacrinus (calyx)—Dev.	2.00	12.00
Rhipidocrinus (calyx)—Dev.	3.00	15.00
Synbathocrinus (calyx)—Dev.	.50	3.00
Dizygocrinus (calyx)—Miss.	.50	1.50
Macrocrinus (calyx)—Miss.	.50	1.50
Platycrinus (calyx with arms)—Miss.	1.50	6.00
Pachylocrinus (calyx with arms)—Miss.	1.50	8.00
Pentacrinus (stems)—Jura	.50	1.00

Asteroidea

Serpent stars—Dev.	3.50	18.00
Asterias—Recent	.25	1.25
Astropecten—Recent	.50	4.00
Culcita—Recent	1.00	6.00
Linckia—Recent	.50	3.00
Luidia—Recent	1.00	4.00
Oreaster—Recent	.75	3.00

Echinoidea

Xenocidaris (plates)—Dev.	.25	1.50
Archaeocidaris (plates)—Carb.	.50	2.00
Archaeocidaris (spines)—Carb.	.50	2.00
Cidaris (spines)—Triassic		.50
Cidaris (spines)—Jurassic		1.00
Cidaris (spines)—Cretaceous	.25	.75
Enallaster (test)—Cret.	.50	3.00
Epiaster (test)—Cret.	.50	2.00
Goniopygus (spines)—Cret.		.50
Pygaulus (test)—Cret.	.50	3.00
Toxaster (test)—Cret.	.50	2.00
Hemiaster (test)—Cret.	.50	3.00
Cassidulus (test)—Cret.	1.00	6.00
Catopygus (test)—Cret.	.50	3.00
Echinobrissus (small)—Cret.	.25	1.50
Micraster (test)—Cret.	1.00	6.00
Scutella (test)—Oligocene	.50	2.50
Dendraster (test)—Plioc.	.75	5.00
Cidaris (test)—Recent	.50	2.00
Echinometra (test)—Recent	.50	2.50
Strongylocentrotus (test)—Recent	1.00	1.50
Echinus—Recent	.75	3.00
Laganum—Recent	.50	2.00
Echinanthus—Recent	.75	
Echinarachnius—Recent	.25	1.00
Brissus—Recent	1.00	4.00

MOLLUSCOIDEA

Bryozoa

	Seltd. spec. each	Aver. spec. per doz.		Seltd. spec. each	Aver. spec. per doz.
Batostoma—Ord.	$ .25	$.50	Fistulipora—Penn.	$ .50	$2.00
Bythopora—Ord.	.25	.50	Coscinopleura—Cret.	.50	2.00
Hallopora—Ord.	.25	.50	Polytrema—Cret.	.25	1.00
Prasopora—Ord.	.25	1.00	Lunulites—Eocene	.25	1.00
Diamesopora—Sil.	.25	1.00	Lepidocyclina—Eocene	.25	1.00
Eridotrypa—Sil.	.25	1.00	Lunularia—Oligocene	.25	1.00
Hederella—Dev.	.50	2.00	Bugula—Recent	.25	1.00
Lioclema—Dev.	.25	1.00	Membranipora—Recent	25	1.00
Archimedes—Miss.	.50	.50			

Brachiopoda

Dicellomus—Camb.	.50	3.00	Eatonia—Dev.	.25	1.00
Lingulella—Cambrian	.50	3.00	Gypidula—Dev.	.25	2.50
Obolus—Cambrian	.50	3.00	Leiorhynchus—Dev.	.25	1.00
Camarotoechia—Ord.	.25	1.50	Leptaena—Dev.	.25	2.00
Catazyga—Ord.	.25	1.00	Martinia—Dev.	.25	1.00
Crania—Ord.	.50	3.00	Meristella—Dev.	.25	1.00
Dalmanella—Ord.	.25	.75	Megalanteris—Dev.	.50	3.00
Dinorthis—Ord.	.25	1.00	Orbiculoidea—Dev.	.25	
Hebertella—Ord.	.25	1.00	Orthostrophia—Dev.	.25	.75
Leptaena—Ord.	.25	2.00	Petrocrania—Dev.	.25	
Orthorhynchula—Ord.	.25		Productella—Dev.	.25	.75
Platystrophia—Ord.	.25	1.00	Rensselaeria—Dev.	.75	
Plectorthis—Ord.	.25	.75	Reticularia—Dev.	.25	.75
Rafinesquina—Ord.	.25	1.00	Rhipidomella—Dev.	.25	.75
Rhynchotrema—Ord.	.25	.75	Schizophoria—Dev.	.25	.75
Schizocrania—Ord.	.25		Spirifer (Trigonotreta)	.25	1.00
Strophomena—Ord.	.25	.75	Spirifer (Adolphia)	.25	.50
Zygospira—Ord.		.25	Stenochisma—Dev.	.25	.75
Anastrophia—Sil.	.25	1.00	Stropheodonta—Dev.	.25	1.00
Atrypa—Sil.	.25	.75	Tropidoleptus—Dev.	.25	1.00
Bilobites—Sil.	.25	1.00	Uncinulinus (Wilsonia)—Dev.	.25	.75
Camarotoechia—Sil.	.25	.50	Camarotoechia—Miss.	.25	.50
Coelospira in rock—Sil.	.25	1.50	Cleiothyridina—Miss.	.25	.75
Dalmanella—Sil.	.25	1.00	Composita—Miss.	.25	1.00
Dictyonella—Sil.	.25		Derbya—Miss.	.50	2.00
Dinobolus (internal cast)—Sil.	.25	1.50	Eumetria (small)—Miss.	.25	.75
Homeospira—Sil.	.25	.75	Lingula—Miss.	.50	
Lingula in rock—Sil.	.75	1.50	Productus—Miss.	.25	1.50
Meristina—Sil.	.25	2.00	Pugnoides—Miss.	.25	1.00
Nucleospira—Sil.	.25	1.50	Spirifer—Miss.	.25	1.50
Pentamerus in rock—Sil.		1.50	Spiriferina—Miss.	.25	.75
Plectambonites—Sil.	.25	1.50	Chonetes—Penn.	.25	.75
Rhipidomella—Sil.	.25	1.50	Composita—Penn.	.25	.50
Rhynchotreta—Sil.	.25	1.50	Derbya—Penn.	.25	1.00
Schellwienella—Sil.	.25	1.50	Dielasma—Penn.	.50	2.50
Spirifer—Sil.	.50	2.00	Enteletes—Penn.	.50	3.00
Uncinulus—Sil.	.50	2.50	Hustedia—Penn.	.50	3.00
Whitfieldella—Sil.	.25	1.50	Marginifera—Penn.	.25	1.00
Athyris—Dev.	.25	.75	Meekella—Penn.	.50	2.00
Atrypa—Dev.	.25	.50	Productus—Penn.	.50	2.00
Bilobites—Dev.	.25	.75	Pugnoides—Penn.	.25	1.00
Camarotoechia—Dev.	.25	1.00	Spirifer—Penn.	.75	2.00
Chonetes—Dev.	.25	2.00	Squamularia—Penn.	.50	1.00
Cyrtia—Dev.	.25	2.00	Camarophoria (small)—Perm.	.25	1.00
Cyrtina—Dev.	.25	1.00	Chonetes—Perm.	.25	.75
Dalmanella—Dev.	.25	1.00	Composita—Perm.	.25	1.00
Douvillina—Dev.	.25	.75	Derbya—Perm.	.50	2.00

Brachiopoda (continued)

	Seltd. spec. each	Aver. spec. per doz.
Dielasma (small)—Perm.	$ .25	$ .75
Meekella—Perm.	.25	2.50
Productus—Perm.	.50	1.00
Coenothyris—Trias.	.25	1.00
Koninckina—Trias.	.25	1.00
Pomatospirella—Trias.	.25	1.00
Rhaetina—Trias.	.25	1.00
Aulacothyris—Jura	.25	.50
Cyclothyris—Jura	.25	.75
Glossothyris—Jura	.25	.75
Ornithella—Jura	.25	.75
Rhynchonella S. S.—Jura	$ .25	
Waldheimia—Jura	.25	$ .75
Cyclothyris—Cret.	.25	.75
Kingena—Cret.	.25	.75
Musculus—Cret.	.25	.50
Terebratulina—Cret.	.25	.50
Terebratula grandis — Eocene	2.00	
Lingula—Recent	.50	4.00
Laqueus—Recent	1.00	3.00
Terebratalia—Recent	.50	3.00

MOLLUSCA

Pelecypoda

Ctenodonta (small)—Ord.	.25	.75
Modiolopsis—Ord.	.50	3.00
Brachiola—Dev.	.25	1.50
Conocardium (internal casts) —Dev.	.25	1.50
Limoptera—Dev.	.50	3.00
Modiomorpha—Dev.	.50	3.00
Mytilarca—Dev.	.50	3.00
Paracyclas—Dev.	.50	3.00
Astartella—Penn.	.25	1.50
Clinopistha—Penn.	.25	1.50
Myalina—Penn.	.25	2.00
Solenomya—Penn.	.25	1.50
Allorisma—Perm.	.50	3.00
Gervillia—Trias.	.50	3.00
Lima—Trias.	.50	2.00
Nucula (small)—Trias.	.25	1.00
Posidonia—Trias	.75	5.00
Cardinia—Jura	.50	3.00
Gryphaea—Jura	.50	3.00
Pholadomya—Jura	.50	3.00
Posidomya in shale—Jura	.25	1.50
Trigonia (very fine)—Jura	1.00	9.00
Exogyra—Comanchic	.50	2.00
Gryphaea—Comanchic	.25	1.00
Lima—Comanchic	.25	1.00
Monopleura—Comanchic	.50	3.00
Pecten—Comanchic	.50	1.50
Plicatula—Comanchic	.25	1.00
Protocardia—Comanchic	.25	2.00
Coralliochama—Cret.	2.00	6.00
Cucullaea—Cret.	.25	2.00
Dosinopsis—Cret.	.25	1.00
Exogyra—Cret.	.25	1.00
Gryphaea—Cret.	.25	1.00
Hippurites—Cret.	1.00	3.00
Inoceramus—Cret.	.50	6.00
Limopsis—Cret.	.25	1.00
Lucina—Cret.	.25	1.00
Martesia—Cret.	.25	2.00
Ostraea—Cret.	.25	1.00
Panopaea—Cret.	.25	1.00
Radiolites—Cret.	1.00	3.00
Toucasia—Cret.	.50	3.00
Veniella—Cret.	.25	.75
Anomia—Eocene	.25	1.00
Arca (small)—Eocene	.25	.75
Cardium—Eocene	.25	1.50
Crassatellites—Eocene	.25	1.50
Cytherea—Eocene	.25	1.00
Egeria—Eocene	.25	.75
Lucina—Eocene	.25	1.50
Macoma—Eocene	.25	1.50
Ostraea—Eocene	.25	1.00
Pectunculus—Eocene	.25	1.50
Plicatula—Eocene	.25	1.00
Venericardia—Eocene	.25	1.50
Yoldia—Eocene		.50
Arca (small)—Oligocene	.25	1.00
Macrocallista—Oligocene	.25	1.50
Pecten—Oligocene	.25	1.50
Pitaria—Oligocene	.25	1.00
Arca—Miocene	.25	1.50
Astarte—Miocene	.25	1.00
Carditamera—Miocene	.25	1.50
Chama—Miocene	.25	1.00
Nucula—Miocene	.25	1.00
Ostraea—Miocene	.25	1.00
Pectunculus—Miocene	.25	2.00
Plicatula—Miocene	.25	1.00
Anomia—Pliocene	.25	1.50
Donax—Pliocene	.25	.75
Ostraea—Pliocene	.25	1.00
Pecten—Pliocene	.50	2.50
Phacoides—Pliocene	.25	1.00
Corbula (small)—Pleistocene	.25	.75
Arca—Recent	.25	1.00
Cardium—Recent	.25	1.50
Donax—Recent	.25	.50
Lucina—Recent	.25	1.50
Mactra—Recent	.25	1.50
Mytilus—Recent	.25	.75
Solen—Recent	.25	.75
Tapes—Recent	.25	1.00
Tellina—Recent	.25	1.00
Unio—Recent	.25	1.00
"Venus"—Recent	.25	1.00

Gastropoda

	Seltd. spec. each	Aver. spec. per doz.
Cyclonema—Ord.	$ .25	$2.50
Lophospira—Ord.	.25	1.00
Maclurina (large)—Ord.	3.00	12.00
Ophileta (small)—Ord.		.50
Megalomus—Sil.	.75	
Tentaculites—Sil.	.25	2.00
Bembexia—Dev.	.25	1.50
Callonema (internal cast)—Dev.	.25	2.00
Diaphorostoma—Dev.	.25	1.50
Euryzone—Dev.	.50	3.00
Loxonema—Dev.	.25	2.00
Naticopsis—Dev.	.50	3.00
Platyceras—Dev.	.50	3.00
Ptomatis (internal cast)—Dev.	.25	2.00
Bellerophon—Carb.	.25	2.00
Igoceras—Carb.	.25	1.00
Euomphalus (small)—Carb.	.25	.50
Holopea (small)—Carb.	.25	.50
Gyronema (small)—Carb.	.25	.50
Euphemus—Carb.	.25	1.50
Phanerotrema—Carb.	.25	1.50
Trepospira—Carb.	.25	1.50
Meekospira—Carb.	.25	2.00
Trachydomia—Carb.	.50	2.50
Euomphalus—Perm.	.25	2.00
Pleurotomaria (small)—Trias.	.25	.75
Pleurotomaria—Jura.	.50	3.00
Anostomopsis—Cret.	.25	1.50
Bauxia—Cret.	.25	1.50
Cyclophorus—Cret.	.25	1.50
Drepanocheilus—Cret.	.25	1.50
Perissoptera—Cret.	.25	1.50
Thaumastus—Cret.	.25	.75
Trochus—Cret.	.25	.75
Tubulostium—Cret.	.25	2.00
Tylostoma—Cret.	.25	1.50
Ancillaria—Eocene	.25	1.50
Ancillopsis—Eocene	.50	2.50
Amauropsis—Eocene	.25	2.00
Campeloma—Eocene	.25	1.50
Caricella—Eocene	.25	2.00
Cerithidea—Eocene	.25	.75
Cerithium—Eocene	.25	1.00
Crepidula—Eocene	.25	1.00
Cingula—Eocene	.25	1.50
Cylichna—Eocene	.25	1.50
Genotia—Eocene	.25	1.50
Goniobasis—Eocene	.25	.75
Genotia—Eocene	.25	1.50
Lacinia—Eocene	.50	3.00
Natica—Eocene	.25	1.00
Oliva—Eocene	.25	1.00
Rimella—Eocene	.25	1.50
Rostellaria—Eocene	.25	1.00
Sycon—Eocene	.25	2.00
Trochita—Eocene	$ .25	$1.50
Turritella—Eocene	.25	1.50
Vivipara—Eocene	.25	1.00
Voluta—Eocene	.50	2.50
Mitra—Oligocene	.50	2.50
Phos—Oligocene	.25	1.50
Pleurotoma—Oligocene	.25	1.50
Sinum—Oligocene	.25	1.50
Ancillaria—Miocene	.25	1.50
Cerithium—Miocene	.25	.75
Clavatula—Miocene	.25	2.00
Conus—Miocene	.25	1.50
Drillia—Miocene	.25	1.00
Nassa—Miocene	.25	1.00
Natica—Miocene	.25	1.00
Pleurotoma—Miocene	.25	1.50
Bullaria—Pliocene	.50	3.00
Cancellaria—Pliocene	.25	1.50
Columbella—Pliocene	.25	1.00
Conus—Pliocene	.25	2.00
Drillia—Pliocene	.25	1.00
Murex—Pliocene	.25	1.00
Nassa—Pliocene	.25	1.00
Natica—Pliocene	.25	2.00
Opalia—Pliocene	.25	1.50
Phos—Pliocene	.25	1.00
Pleurotoma—Pliocene	.25	1.00
Solarium—Pliocene	.25	2.00
Terebra—Pliocene	.25	1.50
Triton—Pliocene	.25	1.50
Typhis—Pliocene	.25	1.50
Valvata—Pleistocene	.25	.50
Acmaea—Recent	.25	.50
Bulla—Recent	.25	2.00
Cassis—Recent	.50	1.00
Cerithium—Recent	.25	.50
Columbella—Recent	.25	.50
Conus—Recent	.50	1.00
Crepidula—Recent	.25	.75
Cypraea—Recent	.50	.50
Helix—Recent	.25	.75
Marginella—Recent	.15	.50
Mitra—Recent	.50	3.00
Murex—Recent	.75	2.00
Nassa—Recent	.25	.50
Natica—Recent	.25	.50
Nerita—Recent	.25	.50
Oliva—Recent	.25	.50
Scalaria—Recent	.25	1.50
Strombus—Recent	.25	.75
Terebra—Recent	.25	.75
Turritella—Recent	.50	.75
Trochus—Recent	.25	.75
Turbo—Recent	.50	1.00
Voluta—Recent	.50	1.50

Scaphopoda

Dentalium—Eocene	.25	1.00	Dentalium—Oligocene	.25	1.00

Cephalopoda

	Seltd. spec. each	Aver. spec. per doz.		Seltd. spec. each	Aver. spec. per doz.
Orthoceras—Ord.	$ .75	$6.00	Arietites—Jura	$2.50	
Tornoceras, ½"–½" (sutures)—Dev.	.75	3.00	Grammoceras	.75	3.00
Gephyroceras, ½"–¾" (sutures)—Dev.	.75	3.00	Harpoceras, ¾"–1½"—Jurassic	.25	1.00
Mimoceras, ½"–1"—Dev.	1.00	6.00	Parkinsonia, 4"–6"—Jurassic	2.50	12.00
Poterioceras—Dev.	3.00	12.00	Perispinctes, ¾"–1½"—Jurassic	.50	1.25
Solenocheilus—Miss.	2.50		Phylloceras, ¾"–1"—Jurassic	.50	2.50
Muensteroceras—Miss.	2.50		Rhacophyllites, ½"–¾"—Jurassic	.50	2.50
Arcestes—Trias.	1.00		Belemnites—Jura	.75	1.00
Beyrichites—Trias.	1.00		Acanthoceras—Cret.	1.50	6.00
Ceratites (no sutures)—Trias.	1.00	6.00	Baculites—Cret.	1.50	6.00
Ceratites (sutures)—Trias.	3.00	18.00	Hoplites—Cret.	.50	3.00
Aegoceras, ¾"–1"—Jurassic	.25	1.50	Schloenbachia—Cret.	3.00	12.00
Amaltheus, 1"–2"—Jurassic	.50		Scaphites, 1"—Cret.	.25	1.50
			Scaphites, larger—Cret.	2.50	12.00
			Nautilus—Recent	3.00	

ARTHROPODA

Trilobita

Agnostus—Camb.	2.50		Calymene—Ord.	2.00	12.00
Callavia (caput)—Camb.	2.50	9.00	Triarthrus—Ord.	2.00	12.00
Ellipsocephalus—Camb.	1.50	12.00	Phacops—Dev.	2.00	12.00
Olenellus (caput)—Camb.	2.50	9.00	Proetus—Dev.	2.50	12.00
Ptychoparia—Camb.	1.50	6.00	Phillipsia—Carb.	3.00	18.00

Ostracoda

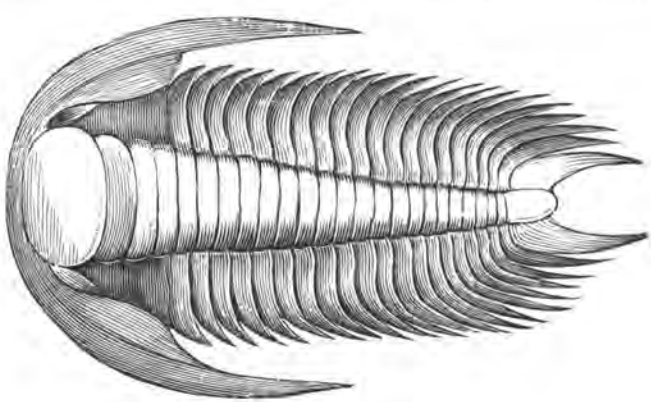
Aeschmina—Sil.	.50	3.00	Leperditia—Carb.	.25	1.00

Insecta

Insect in Amber—Eocene	2.00		Insect in shale—Oligocene	1.50	9.00

VERTEBRATA

Palaeoniscus—Permian	2.00	12.00	Fish teeth—Cret. & Eocene	.25	1.50
Oreodon, fragments—Oligocene	2.00	5.00	Fish—Jurassic	2.00	5.00
			Fish—Eocene	8.00	40.00



C. PALEONTOLOGICAL MODELS

Under Royalty agreements with the American Museum of Natural History and Yale University and others, we reproduce and offer for sale many of their restorations and models.

American Museum Restorations of Fossil Fish and Two Others

PAA–1. Cladoselache fyleri.

Sub-Class I. Selachii, Cuvier
Order Pleuropterygii, Dean

This order includes the most primitive known representatives of the Selachii. The only well defined genus of this order is Cladoselache, confined to the upper Devonian.

PAA–1. Cladoselache fyleri, (Newberry.) (Cast No. 1603). Length 32 inches. Mounted on standard on a hard wood pedestal. The model is based on the well known restoration by Bashford Dean, extensively used in text books. The measurements are taken from the American Museum specimen 5727. Upper Devonian, Cleveland Shale, Ohio. (Am. Museum Restoration.)

Price $20.00

Order Ichthyotomi, Cope

Representatives of this order occur in the Carboniferous and Permian. The best known genus is that represented by our specimen.

PAA–2. Pleuracanthus gaudryi

PAA–2. Pleuracanthus gaudryi, Brongniart. (Cast No. 1604). Length 19½ inches, complete, mounted on standard on hard wood pedestal. Restoration based on Plate V in Brongniart & Sauvage's "Faune Houillere de Commentry" Dumeril. Carboniferous of France. (Am. Museum Restoration.)

Price $20.00

Order Plagiostomi, Dumeril (Sharks & Rays)
Sub-Order Asterospondyli, Harse

The genus Cestracion appears first in the Lithographic Limestone of Bavaria (Jurassic), and a single representative of the genus has survived up to the present day.

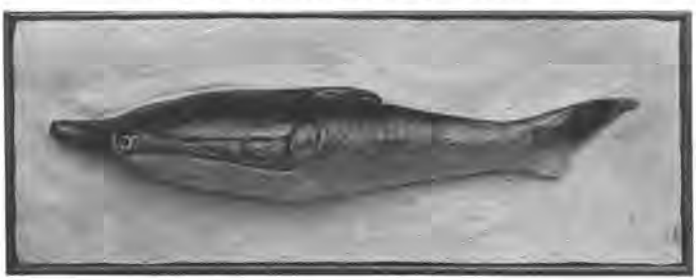
PAA–3. Cestracion philippi, Cuvier. (Cast No. 1612). Our model of the Port Jackson shark is a cast made from an actual specimen from Port Jackson, Australia, now in the U. S. National Museum at Washington. It measures 28 inches in length and can be furnished either on standards and pedestals or for hanging.

Price $25.00

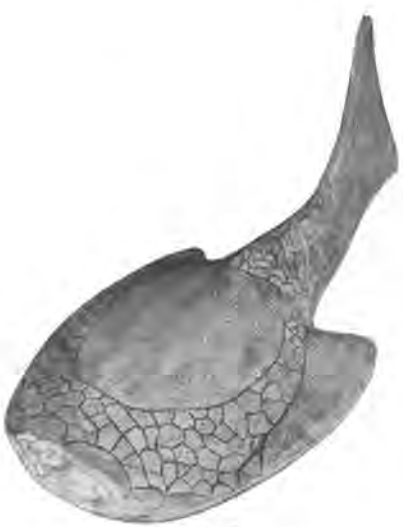
Sub-Class II. Ostracodermi, Cope

Here are placed the early Paleozoic fishes with the endoskeleton not calcified Head and anterior portion of trunk armoured.

Order Heterostraci, Lankester



PAA–4. Pteraspis rostrata



PAA–5

PAA–4. Pteraspis rostrata, Agassiz. (Cast No. 1605). Length 9 inches. Model of ½ fish on slab, based on restoration by A. S. Woodward. Devonian Old Red Sandstone of Scotland. An American Museum Restoration.

Price $7.50

PAA–5. Drepanaspis gemuendenensis. A very careful restoration by a German Paleontologist of this interesting Devonian fish from Bundenbach.

Price $15.00

Order Antiarcha. Cope

The bony plates of this order consist of three layers with numerous bone cells, the outer and inner layers being of a more compact structure than the middle.

PAA–6. Pterichthys milleri, Agassiz. (Cast No. 1606). Length 6 inches, mounted with standard on pedestal of hard wood. Based on restoration by Traquair. Devonian Old Red Sandstone of Scotland. An American Museum Restoration.

Price $10.00

PAA–6. Pterichthys milleri

Sub-Class III. Arthrodira, Woodward

Early Paleozoic fishes with persistent notochord and endoskeleton superficially calcified. Head and trunk armoured with symmetrically arranged plates.

PAA–7. Coccosteus decipiens, Agassiz. (Cast No. 1607). Length 15½ inches, mounted with standards on base. Based on Traquair's restoration modified by Hussakof. Devonian Old Red Sandstone of Scotland. An American Museum Restoration.

Price $12.00

PAA–7. Coccosteus decipiens

Sub-Class V. Ganoidea, Agassiz

This class, between the Selachii on the one side, and the Teleostomi or lung fishes, on the other, contains a large number of both fossil and recent fishes.

Order Crossopterygii. Huxley (Fringe-finned Ganoids)

PAA–9. Polypterus bichir, St. Hilaire. (Cast No. 1609). Length 25½ inches. Cast of one-half of fish on base. This is the only recent representative of the order, while specimens belonging to it have been found in the Devonian age. Our cast was made from a specimen from the River Nile in Egypt. Original by American Museum.

Price $15.00

Order Lepidostei, Huxley

PAA–10. Semionotus agassizi

This order contains the well known "bony pike" of this country, as well as numerous fossil fish.

PAA–10. Semionotus agassizi, (Redfield). (Cast No. 1608). Length 12½ inches, mounted with standards on pedestal. Based on a splendidly preserved specimen in the American Museum of Natural History, and prepared under the supervision of Dr. Hussakof. Triassic of New Jersey. An American Museum Restoration.

Price $15.00

American Museum Casts and Restorations of Fossil Horse

Series of Fossil and Recent Horse Feet

Models No. 1613–14. Eohippus resartus. Fore and hind foot. A representative of "stage b" from the Lower Eocene (Wind River) of Wyoming. Four toes on the fore foot, three toes on the hind foot. Size of a fox. A. M. No. 15428.

Price $4.00

Models No. 1615–16. Mesohippus bairdi. Fore and hind foot. A representative of "stage e" from the Lower Oligocene (White River) of South Dakota. Three toes on fore and hind foot, the fourth (5th digit) represented on the fore foot by a short "splint bone." Lateral toes much reduced, but still touching the ground. Size of a prairie wolf. A. M. Nos. 9777 and 673.

Price $4.00

Models No. 1617–18. Miohippus intermedius. Fore and hind foot. "Stage f" from the Upper Oligocene (White River, Protoceras beds) of South Dakota. Like M. bairdi, but larger. A. M. Nos. 1195 and 705.

Price $5.00

Models No. 1621–22. Merychippus eohipparion. Fore and hind foot. "Stage i" from the Middle Eocene of Colorado. Fifth digit of fore foot a little nodular rudiment; side toes much reduced, not reaching the ground. Size of three months old colt. A. M. No. 9402.

Price $10.00

Models No. 1623–24. Hipparion whitneyi. Fore and hind foot. "Stage j" from the Upper Miocene (Loup Fork) of South Dakota. Feet and limbs elongate; proportions like those of the deer. Side toes more reduced than last; size somewhat larger. A. M. No. 9815.

Price $12.00

Equus caballus. Fore and hind foot. To bring the race to the present day we offer bone preparations of the modern horse.

Price $15.00

PAA–10. Set of 12 as above for $50.00.

PAA–11. Restoration of Eohippus venticolus as modeled by Mr. C. R. Knight. Full size.

Price $25.00

Series of Fossil Horse Teeth

Model 1630. Eohippus borealis. M–2 right and left. Short crowned without cement. Six cusps are shown, with the fusing into cross crests beginning. The left molar is included to show swollen roots.

Lower Eocene (Wasatch beds), Bighorn Basin, Wyoming.

Model 1631. Mesohippus bairdi. M–2 right. Crests in the crown are completely formed and the outside crest has taken the shape of two crescents.

Middle Oligocene (White River), Big Bad Lands, South Dakota.

Model 1632. Parahippus pristinus. M–2 right. The tooth crests are higher and the transverse ridges are beginning to change shape so as to become a second pair of crescents inside the outer pair. In the valleys between the cross crests and on the sides and base of the crown a deposit of cement appears on the surface of the enamel.

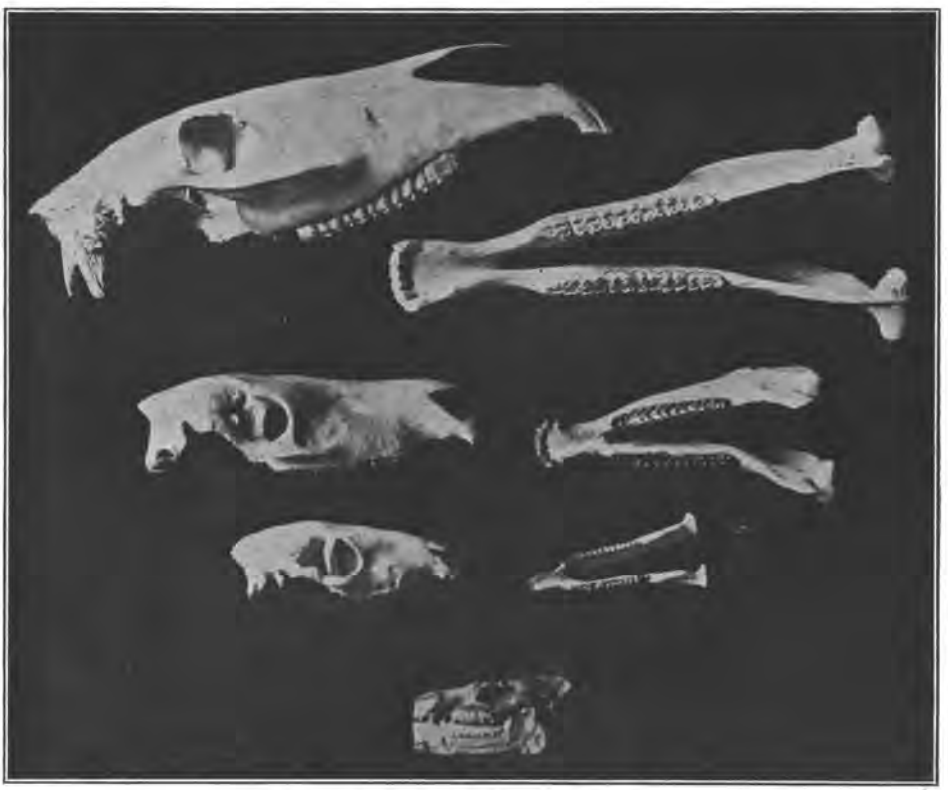
Lower Miocene (Lower Harrison formation), Sioux Co., Nebraska.

Model 1633. Merychippus primus. M–2 right. Intermediate in length and quite heavily cemented. This stage marks the transition between the older short crowned teeth without cement and the long crowned heavily cemented teeth of the later stages.
Middle Miocene (Sheep Creek beds), Sioux Co., Nebraska.

Model 1634. Pliohippus leidyannus. M–2 right. Long crowned and heavily cemented.
Lower Pliocene (Snake Creek beds), Sioux Co., Nebraska.

Model 1635. Equus caballus. M–3 right. Long crowned and heavily cemented tooth of the horse of today.

PAA–12. Set of six casts as above, $10.00.



Series of Fossil Horse Skulls

Model No. 1626. Eohippus venticolus. Crushed skull and jaws, from mounted skeleton in Cope collection. Middle Eocene (Wind River) of Wyoming. Short crowned teeth of primitive pattern. Size of fox. A. M. No. 4832.
Price $4.00

Model No. 1627. Mesohippus bairdi. Skull and jaws. "Stage e" from Lower Oligocene (Oreodon beds, White River) of Nebraska. Short crowned teeth of more horse-like pattern. Size of prairie wolf. A. M. No. 1477.
Price $8.00

Model No. 1629. Merychippus sejunctus. Skull and jaws. "Stage i" from Middle Miocene (Loup Fork) of Colorado. Moderately long crowned teeth with cement. Pattern intermediate between Mesohippus and Equus. Size of three months old colt. A. M. No. 8291.
Price $15.00

Equus caballus. Skull and jaws of modern horse.
Price $12.00

PAA–13. Set of four skulls as above for $37.50.

LULL RESTORATIONS

Models by Richard S. Lull, Ph. D., Asst. Curator in Vert. Palaeontology, Peabody Museum, Yale University

Model No. 1564

CERATOPSIA MODELS

The Ceratopsia or horned dinosaurs were apparently confined to the western part of North America, living during the closing scenes of the Cretacic period along what is now the eastern uplift of the Rocky Mountains. They were plant feeding reptiles living in the savannah-like lowlands, which bordered on the west the great inland Cretaceous sea.

In character they were heavy, unwieldy quadrupeds of which by far the most striking feature was the huge head with its offensive armament of horns on the nose and above the eyes, and for defense the large backwardly projecting bony crest or frill.

Their evolution consisted briefly in an increase in size, the development and final perfection of the frill, the retrogression of the large nasal horn and the reciprocal increase of those borne above the eyes until they attained, in the later types, tremendous size.

They first appear in time in the so called Judith River (Belly River) beds in the latter part of the Upper Cretacic; the Judith River types Ceratops and Monoclonius being characterized by a dominant nasal and rudimentary supra-orbital horns. Following the Judith River is a break in our geologic record, after which the dinosaur bearing beds (Laramie, Lance, or Ceratops) reappear. Now the Ceratopsia have a shorter nasal horn and larger and larger supra-orbitals the higher in the strata they are found. The main race is Triceratops, represented by the shorthorned brevicornus, the symmetrically armed prorsus, and culminating in the huge elatus with a skull in one instance no less than eight feet in length. As side lines of this race appear the curious Diceratops having no nasal horn at all, and Torosaurus, retaining the Archaic type of crest, with a head actually longer than the huge Triceratops contemporary.

The heads, represented with a scale of $\frac{1}{8}$ linear dimensions, are based upon specimens preserved in the U. S. National Museum (U. S. N. M.), American Museum of Natural History (A. M. N. H.), and the Peabody Museum of Yale University.

No. 1560. Monoclonius crassus, Marsh.
Judith River Beds. (U. S. N. M.), length 8 in. ..... Price $6.00

No. 1563. Ceratops recurvicornis, Cope
Judith River Beds. (A. M. N. H.), length 7½ in. .. Price $6.00

No. 1558. Triceratops brevicornus, Hatcher.
Laramie. (Yale), length 7¾ in. ..... Price $6.00

No. 1559. Triceratops prorsus, Marsh.
Laramie. (Yale), length 8 in. ..... Price $6.00

No. 1566. Triceratops elatus, Marsh.
Laramie. (U. S. N. M.), length 10 in ..... Price $6.00

No. 1562. Diceratops hatcheri, Lull.
(U. S. N. M.), length 8 in. ... . Price $6.00

No. 1561. Torosaurus latus, Marsh.
(Yale), length 10½ in. ..... Price $6.00

No. 1564. Triceratops prorsus, Marsh. Restoration of entire animal. Scale $\frac{1}{10}$ linear dimensions. Length of base 24 in. The skull is based upon the type specimen at Yale, and the body upon the mounted skeleton in the U. S. N. M. ..... Price $15.00

No. 1565. Triceratops. Model of skull showing muscalature; one-fourth natural size; based upon the type skull of T. serratus, Marsh, (Yale Museum); the muscles being restored from the pronounced muscular depressions seen on the original; aided by a comparative study of the muscalature of the modern chameleon, which exhibits some very remarkable features of convergence toward the Ceratopsia. Length of base, 19 in. ..... Price $ 8.00

Pal.–20. Ceratopsia Series, Nine Pieces, $60.00

PROBOSCIDEA MODELS

No. 1573

Elephantine evolution implies the retention of certain primitive features especially in the type of feet and brain, but in harmony with increasing bulk an extreme specialization of teeth, tusks, trunk or proboscis and skull. The early evolution consisted not alone of the reduction in numbers and increase in complexity of the grinding teeth, but in a curious modification of the incisor teeth, both above and below, for digging, with a consequent lengthening especially of the lower jaw. This necessitated a proportionate elongation of the nose and upper lip as a prehensile organ for obtaining food which, however, on account of the rigid support afforded by the lengthening jaw was of more limited use than now.

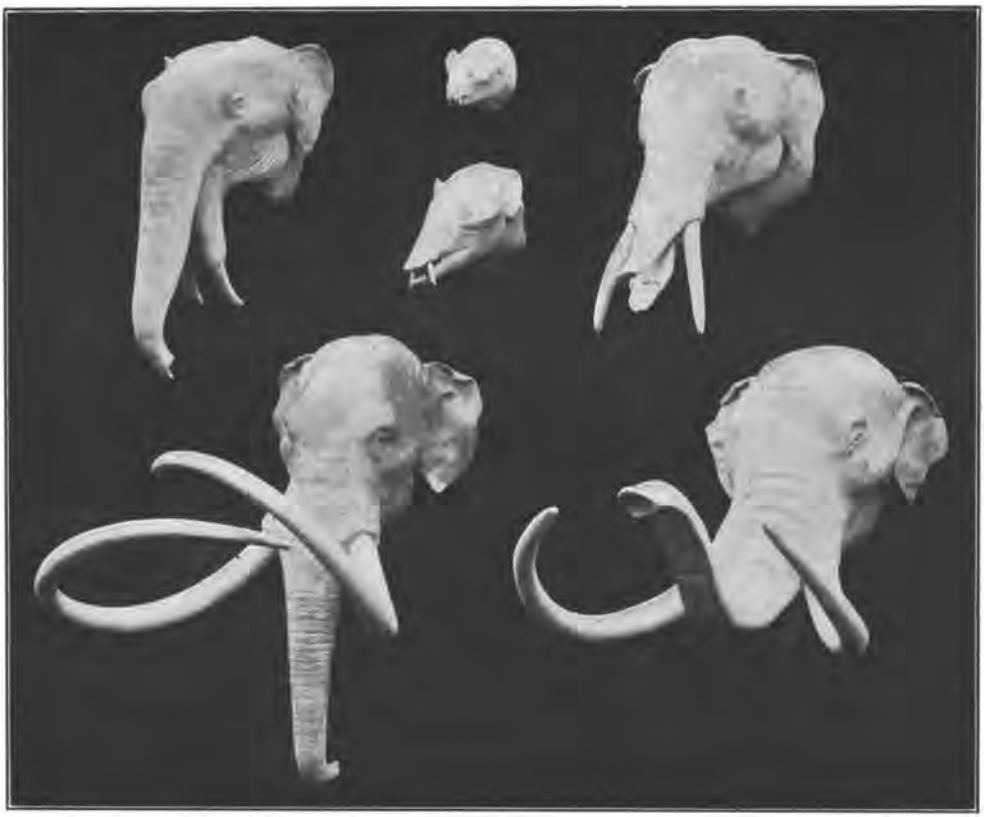
Of the Archaic elephants three are represented in the series, the first of which is Moeritherium, a form showing so many curious similarities to the Sirenia or sea cows as to be conclusive evidence, in spite of their present day differences, of the derivation of Sirenia and Proboscidea from a common stem. This animal was followed by Palaeomastodon, a more elephant-like form with larger jaws, which in turn gave rise to Tetrabelodon (or Trilophodon), in which the culmination of this evolution is reached. We have now the remarkable happening of a race which had apparently run its course, gaining a further lease of life, which could only be attained through the sacrifice of the elongation of the lower jaw, impeding as it did the movement of the proboscis and limiting further evolution. This was accomplished in two ways, the less drastic of which (Dinotherium) resulted in a downward bending of the jaw, the tusks being still retained.

The other line of evolution resulted in a bodily shortening of the jaw, the upper tusks being retained, and (with the exception of the persistently primitive American Mastodon which sometimes shows them) an utter loss of those of the lower jaw. These modernized Proboscidians are represented by the American Mastodon (Pliocene and Pleistocene) with comparatively simple teeth fitted for browsing on tender leaves and twigs, and the Columbian Mammoth, Elephas columbi (Pliocene), with complex grinding teeth for harsher herbage, and immense curving tusks.

Restorations of heads ¼ linear dimensions

		Price
No. 1567.	**Moeritherium.** Based on British Museum skull. Size 5½ in.	$5.00
No. 1568.	**Palaeomastodon.** Based on British Museum skull. Size 9 in.	6.00
No. 1569.	**Trilophodon.** Based on material in Museum of Jardin des Plantes, Paris. Size 20 in.	10.00
No. 1570.	**Dinotherium.** Based on specimen in British Museum. Size 20 in.	10.00
No. 1571.	**Elephas columbi.** Based on A. M. N. H. material. Size 26 in.	15.00
No. 1572.	**Mastodon.** Based on specimen in Peabody Museum. Size 26 in.	15.00
No. 1573.	**Mastodon Americanum.** Based on skeleton in Peabody Museum at Yale. One-eighth linear dimension. Length 22 in.	15.00

Pal.–21. Set of Seven Proboscidea Models $70.00



Lull's Models of Proboscidea Heads

HORSE EVOLUTION SERIES

The evolution of the horse implied a known increase of stature from about 14 inches to 64 inches for the average large horse of today. It also implies as an adaptation for running, the principal means of defense from its enemies, an increase in the length of limb, the elongation and strengthening of the middle (3rd) toe of each foot, and a progressive shortening and final loss of the lateral toes.

EOCENE HORSE

Orohippus agilis, Marsh. Bridger beds of Western Wyoming.

A typical Eocene horse about 14 inches (3½ hands) in height, with 4 toes on the front foot one of which was already off the ground. The hind foot was 3-toed, with small vestiges of the first and fifth still remaining.

No. 1580. Cast of fore foot from type specimen. Catalogue No. 11268.
No. 1581. Cast of hind foot from another individual. Catalogue No. 11277.
Nos. 1582 and 1583. Restoration of L. fore foot and L. hind foot in flesh.

OLIGOCENE HORSE

Mesohippus sp. White River beds, Nebraska or Dakota.

An animal about 18 inches (4½ hands) in height, 3-toed in front and behind, but with a vestige of the first still remaining.

No. 1584. Cast of R. hind foot. Catalogue No. 11305.
No. 1585. Cast of R. fore foot. Catalogue No. 11311.
Nos. 1586 and 1587. Flesh restoration of above.

Miohippus sp. John Day beds, John Day River, Oregon.

An animal somewhat larger than Mesohippus.

No. 1588. Cast of left fore foot. No. 11293.
No. 1589. Cast of left hind foot. No. 11282.

MIOCENE HORSE

Hypohippus sp. Loup Fork beds, Nebraska.

Browsing (forest) horse; a persistently primitive type adapted for forest dwelling, which because of its browsing teeth and spreading feet, became extinct with reduction of forest conditions and development of prairies. About 40 inches (10 hands) high.

No. 1590. Cast of fore foot. Catalogue No. 13030.
No. 1591. Restoration of foot. Catalogue No. 13030.

Merychippus. Loup Fork beds, Nebraska.

Prairie horse; the first true grazing horse with long crowned teeth and in the direct line of ancestry of the modern horse. Feet still 3-toed, but lateral toes, high above the ground, fast disappearing; an adaptation to the hard prairie soil. Animal about 32 inches (8 hands) high.

No. 1592. Cast of R. hind foot. Catalogue No. 11463.
No. 1593. Restoration of foot in flesh

Lull's Models of Horse Feet

PLIOCENE HORSE

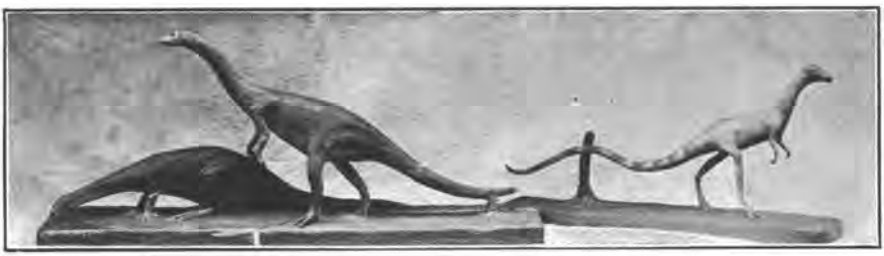
Pliohippus pernix, Marsh. Niobrara River, Nebraska.

This, apparently the first 1-toed horse, had extremely slender splint bones, vestiges of the second and fourth digits, which may have borne tiny hoofs, though of this there is no proof. Pliohippus was probably in the modern horse ancestry; height 48 inches (12 hands), about that of a modern Shetland pony.

No. 1594. Cast of L. fore foot. Type specimen No. 13007.
No. 1595. Cast of R. hind foot. Type specimen No. 13007.
No. 1596. Restoration of L. fore foot in the flesh.

Pal.–22. Series of Seventeen Casts and Models, Labeled and Mounted Upright, on Two Polished Hardwood Pedestals $50.00

TRIASSIC VERTEBRATES OF THE CONNECTICUT VALLEY



No. 1577 No. 1576

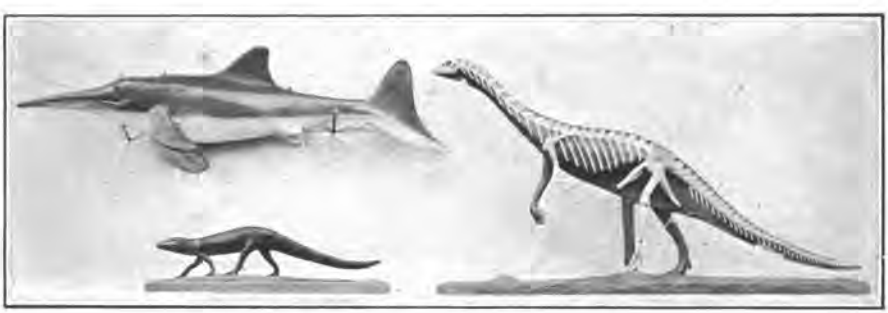
The remains of these creatures consist of a few skeletons, unfortunately of but three dissimilar types, and a host of footprints, the latter indicating a great range of adaptations to the life of the time and place. Most of these, however, give too vague a knowledge of their makers to justify an attempt to resore them in the flesh. All the restorations which can now be made with any approach to scientific value have been prepared by Professor Lull as follows:

No. 1575. Anchisaurus colurus, Marsh. Carnivorous dinosaur from Manchester, Conn., known from the practically complete type skeleton in the Yale Museum collections. Upon the left side of the statuette the bones have been restored, while the right aspect shows the animal in the flesh. One-third natural size (linear dimensions). Length of base 25 in.

Price $15.00

No. 1576. Podokesaurus holyokensis, Talbot. A swift, agile dinosaur found in South Hadley, Mass. Restoration in the flesh, one-half natural size, based upon the type specimen preserved in the museum of Mount Holyoke College, supplemented by that of Compsognathus longipes, Wagner, from the Lithographic stone (Jurassic) of Kelheim, Bavaria, now in the Alte Academie at Munich. Base 20 in.

Price $10.00



No. 1578 No. 1575

No. 1577. Anomoepus scambus, Hitchcock. A group of two small plant-feeding dinosaurs, one in the walking and the other in the quadrupedal posture. Restored from their footprints with the aid of the skeleton of Hypsilophodon foxii, Huxley, from the Wealden (Lower Cretaceous) of the Isle of Wight. One-half natural size. Length of base 27 in.

Price $17.50

No. 1578. Stegomus longipes, Emerson and Loomis. A small armored cursorial aëtosaur, distinctly related to the modern crocodiles. Restoration based upon skeleton found at East Longmeadow, Mass., and now preserved in the museum of Amherst College. Natural size. Length of base 13 in.

Price $6.00

Pal.–23. Series of Five Models of Triassic Vertebrates $45.00

BEECHER MODELS

BEECHER MODELS OF BRACHIOPODS

This magnificent series of twenty models is made after preparations by Dr. C. E. Beecher for the Yale University Museum. It consists of

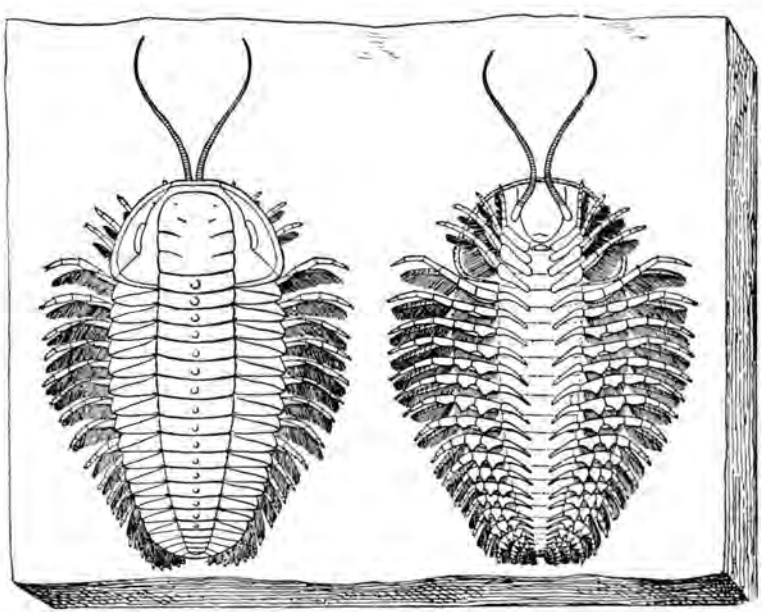
(a) EMBRYONIC STAGES of a typical brachiopod, **Cistella neapolitana,** illustrating, in ten papier maché models, its development from the Protembryo represented by the unsegmented ovum and the ovum composed of two spheres; the Mesembryo by the blastosphere; the Metembryo by the gastrula; the Neoembryo by embryos of two and three segments, the latter in two models showing the incomplete and completed cephalula stages; the Typembryo in incomplete and completed stages; and the Phylembryo with its protegulum or embryonic shell. The eye spots and setæ, when present, are shown; and the shell-secreting surfaces are distinctively colored.

BEECHER MODELS OF BRACHIOPODS (continued)

(b) DORSAL VALVES of ten typical genera showing the hinge structure, cardinal processes, hinge plates, septa, muscular scars, vascular markings, crura and arm supports. The latter, which in the majority of brachipods furnish the most important family and generic characters, are made of metal and colored distinctively. The papier maché shells have an average diameter of 2½ inches, so that the various details are sufficiently large to be readily seen. Zygospira, Cyclospira, Spirifer, Nucleospira, Rhynchospira, Uncites, Meristina, Athyris, Koninckina and Magellania are the genera illustrated.

The two series, **a** and **b**, complement each other; and, taken together, form an exceedingly instructive set. They will be sold in handsome brass-trimmed, quartered oak case, 14 x 22 inches, cloth lined, with removable inner glass cover and large explanatory label.

PAB–30. Complete Set as illustrated ..... $70; without case, $60.
Series a ..... with case, $15; without case, $12.
Series b ..... with case, $58; without case, $50.



Restoration of Triarthrus becki

After preparations by Dr. Chas. E. Beecher, Yale University

		Price
PAB–32.	**Restoration of Triarthrus becki** dorsal and ventral sides on single placque 4½ x 6½	$7.50
PAB–33.	**Restoration of Eurypterus fischeri,** Eichwald. 2 placques each 12 x 8½, showing dorsal and ventral surfaces	7.50
PAB–34.	**Restoration of Hughmilleria socialis,** Sarle. 2 placques each 12 x 8½ showing dorsal and ventral surfaces	7.50

OTHER CASTS AND RESTORATIONS

PAT–35. Restoration of six arthropods prepared by Miss Helen Jean Thomson for the Carnegie Museum at Pittsburgh.

PAT–35c

PAT–35d

PAT–35a

(a) Belinurus lacoei, Packard 7 x 4 Coal Measure.
(b) Prestwichia danae, Meek 7 x 4 Coal Measure.
(c) Bunodes lunula, Nieszk 7 x 4 Silurian.
(d) Strabops thatcheri, Beecher 8 x 5 Cambrian.
(e) Stylonurus cestrodus, Clark 8 x 5½ Silurian.
(f) Palaeophonus nuncius, F. & L. 7¾ x 4¾ Silurian.

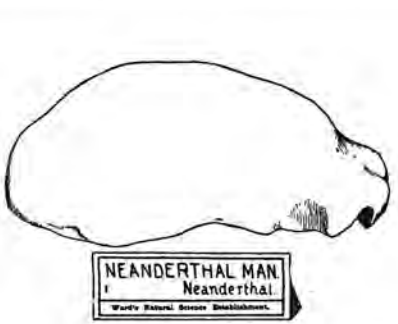
PRICE, SINGLE MODELS $2.50 SET OF SIX $12.00

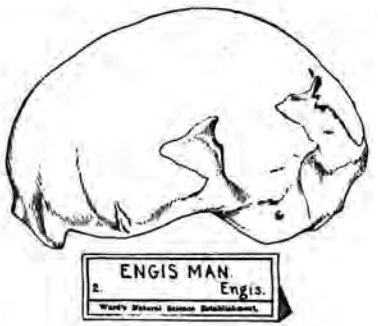
CASTS OF FAMOUS SPECIMENS

PAG–40. Archaeopteryx macroura, a cast of the British Museum specimen of this Jurassic bird 18″ x 24″ $12.50

PAG–41. Rhamporhynchus phyllurus, Pterodactyl on slab from Lithographic limestone of Solenhofen, size 10 x 16. Original in Museum at Yale University $8.00

PAG–42. Compsognathus longipes, skeleton on slab 12″ x 14″. This is the most bird like of the Dinosaurs. Original is in the Munich Museum $8.00





PREHISTORIC REMAINS

Eoanthropus dawsonii

		Price
PAC–50.	**Restoration of skull and mandible of Piltown man**	$25.00

Homo heidelbergensis

PAC–51.	**The Mauer jaw.** More primitive than the Neanderthal type. Cast No. 3152	5.00

Homo neanderthaloides or primigenius

PAC–52.	**The Neanderthal cranium,** from the Valley of Neander, Rhenish Prussia. Cast No. 2000	2.50
	The Men of Spy, found in a cave near Spy, Belgium	
PAC–53.	**Cast of cranium No. 1.** Cast No. 2003	2.50
PAC–54.	**Cast of cranium No. 2.** Cast No. 2014	3.00
	The Brünn crania, found in the Löess, Brünn, Mähren, Germany	
PAC–55.	**Cast of cranium No. 1.** Cast No. 3151	3.00
PAC–56.	**Cast of cranium No. 2.** Cast No. 3144	3.00

Homo sapiens

PAC–57.	**The Engis cranium,** found in a cave on the bank of the Meuse, near Liege, Belgium. Cast No. 2002	2.50
	The Cro Magnon skulls, found in caves at les Eyzias Tayac District, Dordogne, France.	
PAC–58.	**Cro Magnon No. 1** (Old Man of Cro Magnon). Skull with lower jaw. Casts Nos. 3090 and 3091	4.00
PAC–59.	**Cro Magnon cranium No. 2.** Cast No. 3089	3.00

Casts of Recent Race Skulls for Comparison

Australian cranium. Cast No. 3127	2.50
Hottentot Venus. Bojesman woman from South Africa. Cast No. 5011	4.00
Indian from ancient tombs of Bolivia. Cast No. 5005	4.00
Negress. Kaffir type from Mozambique. Cast No. 5013	4.00
Tasmanian. A peculiar isolated type now extinct. Cast No. 5018	4.00
Caucasian woman. Cast No. 5019	4.00
Maori, from New Zealand. Cast No. 5021	4.00
Mongolian. Cast No. 5022	4.00
Chinese. Cast No. 5024	4.00

Prehistoric Anthropoids

PAC–61. Pithecanthropus erectus (The Ape Man), from the Pliocene of Java. Cast No. 2181 ..... 4.00

PAC–62. Dryopithecus fontani, from Miocene of France. Mandible. Cast No. 5 ..... 2.00

PAC–63. Mesopithecus pentelici, from the Pliocene of Greece. Cranium. Cast No. 1251 ..... 2.00

Recent Anthropoids for Comparison

Gorilla. Cast of skull and lower jaw of adult male 8.00

Gorilla. Cast of skull and lower jaw of adult female 6.00

Chimpanzee. Cast of skull and lower jaw of adult male 6.00

Orang Outang. Cast of skull and lower jaw of adult male 6.00

Orang Outang. Cast of skull and lower jaw of adult female 6.00

Gibbon. Cast of skull and lower jaw of adult male 4.00

D. REPRODUCTIONS OF SOME FAMOUS ANCIENT WRITINGS

The Temple Stone

PAW–70. The "Temple Stone" 3′ x 2′, the only well authenticated relic of the great Temple at Jerusalem, one of the inscribed stones put up by Herod a few years before the birth of Jesus. Original in Royal Museum at Constantinople.

Price $25.00

PAW–71. The Rosetta stone, this is probably the most celebrated of known inscriptions due to the fact that the inscription appears in Egyptian hieroglyphics, Demotic, and in Greek, it made possible the reading of previous undecipherable inscriptions. Size 3′3″ x 2′6″. Original in British Museum.

Price $25.00

PAW–72. The "Moabite Stone" 4 ft. 2 in. long by 2 ft. 4 in. wide with an inscription of 34 lines of Phoenician characters, telling of the revolt of Mesha, King of Moab against the Israelites. Original in the Louvre in Paris.

Price $50.00

The Rosetta Stone

The Black Obelisk

PAW–73. The black obelisk of Shalmaneser II. 6 ft. 8 in. high x 2 ft. 2 in. wide by 1 ft. 6 in. thick, recording the annals of conquests of Shalmaneser, who died 823 B. C. Original in the British Museum.

Price $125.00

PAW–74. Siloam inscription supposed to have been executed in the reign of Hezekiah, 2 ft. 4 in. x 1 ft. 2 in.

Price $15.00

PAW–75. The Chaldean Deluge Tablets supposed to have been made about 600 B. C., a copy of an older text dating back to 17th. century B. C., The "book" consists of 2 leaves each 6" x 5" covered by cuneiform characters, and is now in the British Museum.

Price $10.00

E. PALEONTOLOGICAL CHARTS

The Zittel Charts Published by Prof. K. A. Von Zittel and Prof K. Haushofen of Munich. Size, 39 by 55 Inches.

These charts long ago proved their usefulness, and filled the need so well that, to our knowledge, no similar series has been published.

The complete series contains:

A. Six ideal landscapes.

B. 76 charts of fossil animals covering all the classes from Rhizopoda to Mammalia.

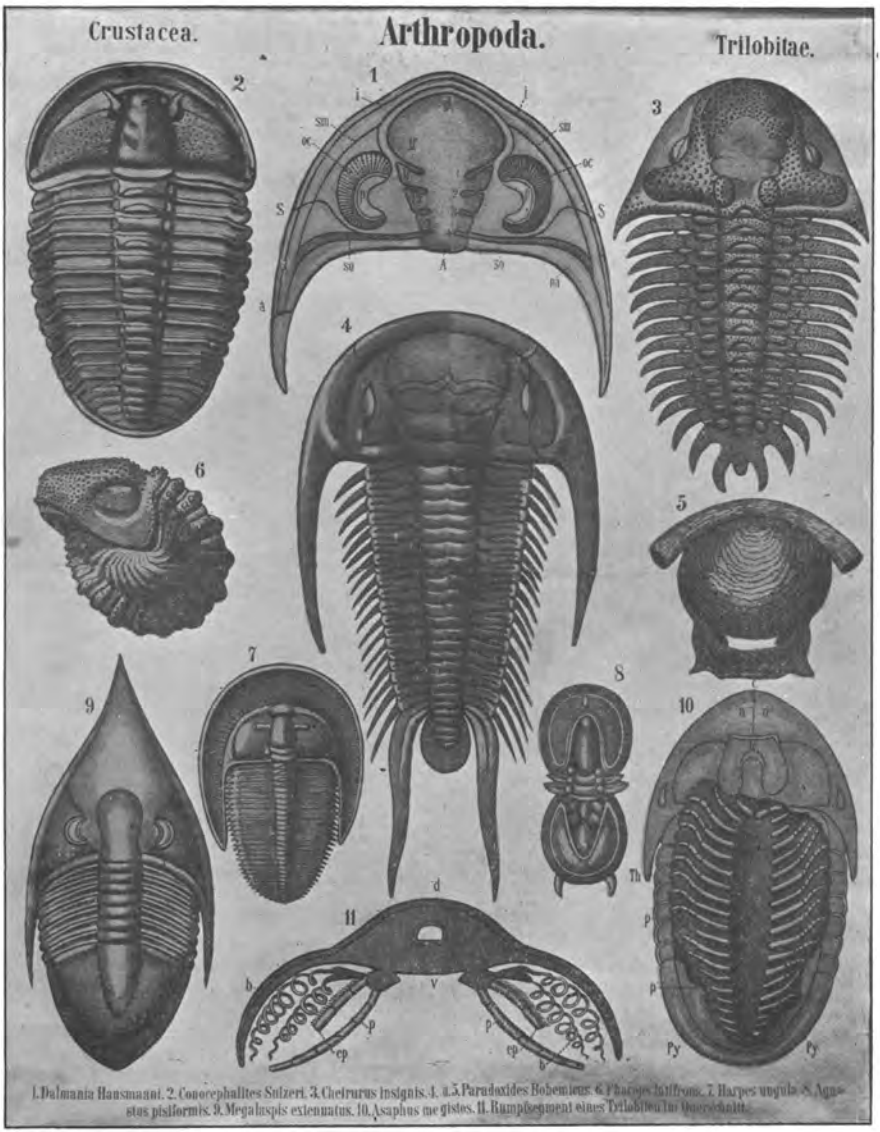
C. Ten charts of fossil plants.

These charts may be imported free of duty for educational institutions, and for this reason we do not carry them in stock. About two months are required for delivery.

Price for single charts mounted on cloth, with rollers	$5.00
Price for 30 or more charts ordered at one time, each	4.50
Price for 75 or more charts ordered at one time, each	4.00
Price for the complete series of 92 charts, each	3.50

Our catalogue No. 10 gives a complete list of these charts, and it will gladly be mailed to those interested.

N.B.—See cut, next page.

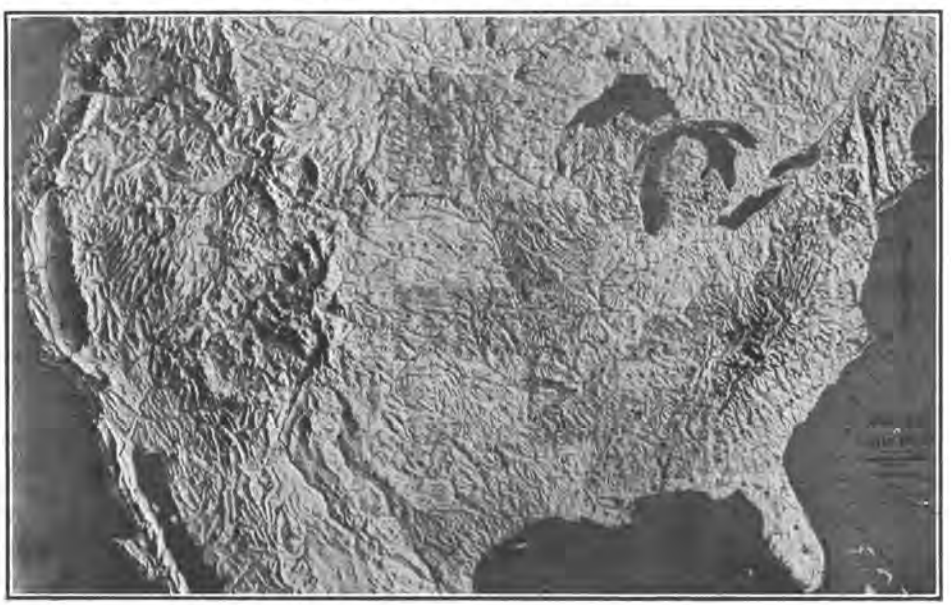


Zittel Chart No. 30.

SECTION IX.
RELIEF MAPS AND GEOLOGICAL MODELS

Relief maps and models have now become recognized adjuncts of all good teaching. We have been preparing these for over fifty years, and so have moulds of a considerable number, from which we can make reproductions at a small fraction of what a new relief map would cost. We are, however, equally ready to make new reliefs and models from data furnished us, but for that work we must ask for considerable time, as to make an accurate relief map is a slow piece of work, requiring both patience and skill. We list some of those already prepared, and will gladly send circular No. 271 and give further particulars to those interested.

A. RELIEF MAPS



The United States

No. 1. Relief Map of the United States, showing all the states in color (see cut above). Size of map 29 in. by 46 in. Scale, 32 miles equals one inch. Vertical exaggeration 20:1.

Price $30.00

No. 1a. Relief Map of the United States, same as No. 1, but colored to show the annual average rainfall in the different parts of the United States. A very interesting and instructive map.

Price $50.00

No. 1b. Relief Map of the United States, same as No. 1, but showing how the northern part was covered by the great glacial ice sheet. The location of this sheet is from the very latest data available, furnished to us through the courtesy of the United States Geological Survey by Mr. Frank Leverett.

Price $50.00

No. 2. Geological Relief Map of the United States. This is the same map as No. 1, but is painted by hand to show the geology as given in Professional Paper No. 71 of the United States Geological Survey.

Price $150.00

No. 3. Relief Map of New York State. This map shows all the principal lakes, bays, rivers, railroads and towns, each named and properly located, as well as the mountain ranges and their important peaks. (There is also an insert showing the City of New York. Scale one inch equals two miles). Size of map, 48 inches by 36 inches. Scale, eight miles to one inch. Vertical exaggeration 5:1.

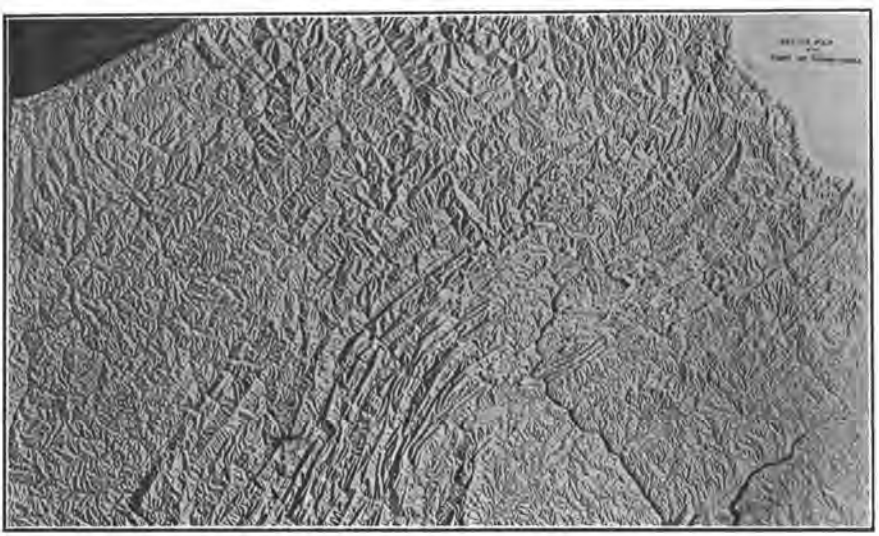
Price $35.00

No. 4. Geological Relief Map of New York State. Professor George H. Chadwick of the University of Rochester has given us permission to copy the geology of the state as he has worked it out from his own observation, aided by the latest surveys and reports. This gives an up-to-date map showing accurately the various formations of this state, which more than any other has been used for a basis in correlating the early formations of this country. No college should be without this important piece of work.

Price $125.00

No. 5. Relief Map of New York City and vicinity. Size of map, 11 inches by 20 inches. Scale, two miles equals one inch. Vertical exaggeration 4:1.

Price $10.00



No. 6. Pennsylvania

No. 6. Relief Map of Pennsylvania, one of the most interesting of the states. The curious geological structure can be properly studied only by means of a relief. This map is hand painted, and only the principal cities and rivers are named. Size 35 inches by 56 inches. Horizontal scale, six miles equals one inch. Vertical exaggeration 5 to 1.

Price $70.00

No. 7. Relief Map of Massachusetts. Due to the numerous requests received from the schools, we have just prepared and added to our series this most important state. The principal cities, rivers, railroads, etc., are all named and properly placed. Size of map, 48 inches by 30 inches. Horizontal scale, 1 inch equals 4 miles. Vertical exaggeration 4 to 1.

Price $35.00

No. 8. Relief Map of California. The "Golden Gate" is shown in all its details, as well as the principal cities, towns, lakes, railroads, etc. Size, 32 inches by 39 inches. Scale, 18 miles equals one inch. Vertical exaggeration 6:1.

Price $35.00

No. 9. Relief Map of Oregon. Size of map, 30 inches by 40 inches. Scale, 10 miles equals one inch. Vertical exaggeration 3:1. (see cut, page 181.)

Price $35.00

No. 10. Relief map of Washington. Size of map, 27 inches by 40 inches. Scale, 10 miles equals one inch. Vertical exaggeration 3:1.

Price $35.00

No. 9. Oregon

No. 11. Relief Map of Idaho. The original of this map was made by the Idaho School of Mines, and it shows exceedingly well the mountainous structure of this state. The map is hand painted, showing the counties and some of the principal rivers and cities. Size, 5 feet 3 inches by 3 feet 2 inches. Horizontal scale, 8 miles equals 1 inch. Vertical scale, 8000 feet equals 1 inch.

Price $100.00

No. 12. Relief Map of the Grand Canyon of the Colorado River. This wonderful canyon is too well known to require description, but until a relief is seen it cannot be properly understood. It is hand painted. Size, 3 feet by 3 feet.

Price $50.00

No. 12a. Grand Canyon as above, colored to show the geology of the region.

Price $75.00

No. 13. The Crater Lake of Oregon (see cut, page 183). One of the wonders of the world. Size, 16½ inches by 19 inches. Horizontal scale, 1 mile equals 1 inch. Vertical scale, 2 miles equals 1 inch.

Price $20.00

No. 14. Niagara Falls

No. 14. Relief Map of Niagara Falls and Gorge. Due to the fact that the water is continually eating away the rock, it is most important to have a permanent record of the condition at this time. Size of map, 5 feet 6 inches by 2 feet 2 inches. Horizontal scale, 500 feet equals 1 inch. Vertical scale, 250 feet equals 1 inch. Colored geologically.

Price $100.00

GR–15. Relief map of Colorado, a state of very great interest to the geologist. This map is hand painted to show the geology as understood at present. The data was provided by the state geologist, Mr. R. D. George. The most important rivers and cities are shown. Size, 41 by 32 inches. Scale, ten miles to the inch.

Price $75.00

No. 16. Relief Map of a section of Missouri, selected to show "Subterranean Stream Piracy." The original was made by Prof. Dake of the Missouri School of Mines. Size, 14 inches by 16 inches. Horizontal scale, 333 feet equals 1 inch. Vertical scale, 160 feet equals 1 inch.

Price $20.00

GEOLOGICAL RELIEF MAPS

of interesting sections of North America prepared under the direction of the Geological Society of America. This series will, if the demand justifies the work, consist of ten models. Up to the present time five have been prepared, as follows:

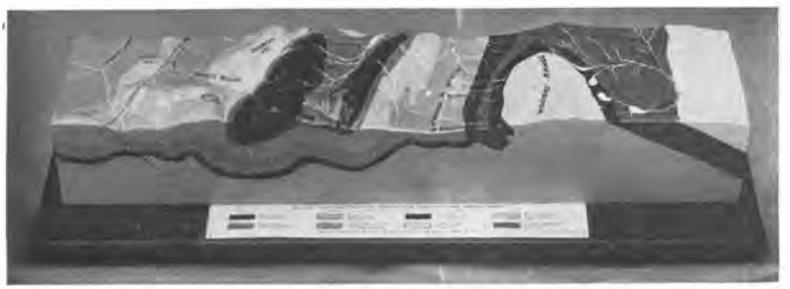
No. 25. Relief Map of section across the Rocky Mountains in the vicinity of the Canadian Pacific Railway. This model was made by us from data furnished by Prof. Rollin T. Chamberlin of the University of Chicago, and the geology as shown was worked out by Mr. Towner B. Root under Prof. Chamberlin's direction. Due to the elevation of the section it proved possible to make the model without the vertical exaggeration usually required in relief maps. Size, 31 inches by 6 inches. Scale, 2⅝ miles equals 1 inch.

Price $50.00

No. 25. Section across the Rocky Mountains

No. 26. Relief Map of Mount Greylock. This model was made by us from data furnished by Prof. Cleland of Williams College. Size, 27 inches by 6 inches by 4 inches. Scale, 1 mile equals 2 inches.

Price $32.50



No. 26. Mount Greylock

No. 27. Relief map across the Southern Appalachians. This model was made from data furnished us by Prof. Rollin T. Chamberlin of the University of Chicago. Size, 37 inches by 7½ inches. Scale 1:125000.

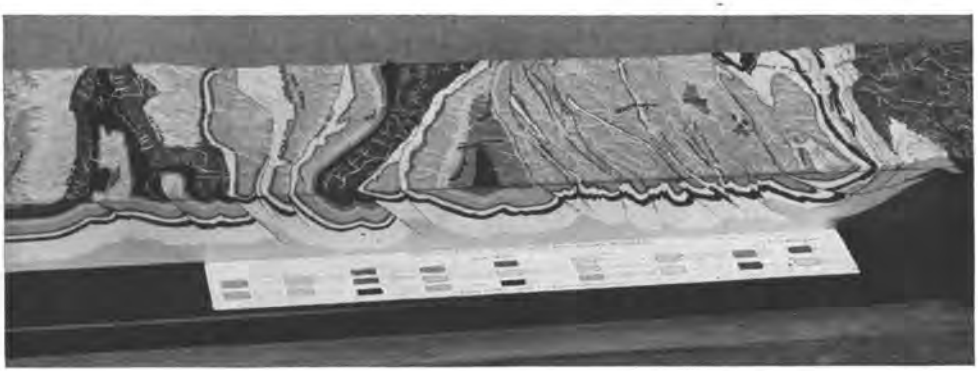
Price $75.00

No. 28. Relief Map of Piedmont region, prepared from data furnished by Prof. Bascom of Bryn Mawr, and complete map approved by her. Size, 5 feet by 1 foot.

Price $100.00

No. 29. Relief Map of Monteregian district, prepared from data furnished by Prof. W. V. Howard of Williams College. Size, 3 feet 4½ inches by 1 foot. Horizontal scale, 2 miles equals 1 inch. Vertical exaggeration 4:1.

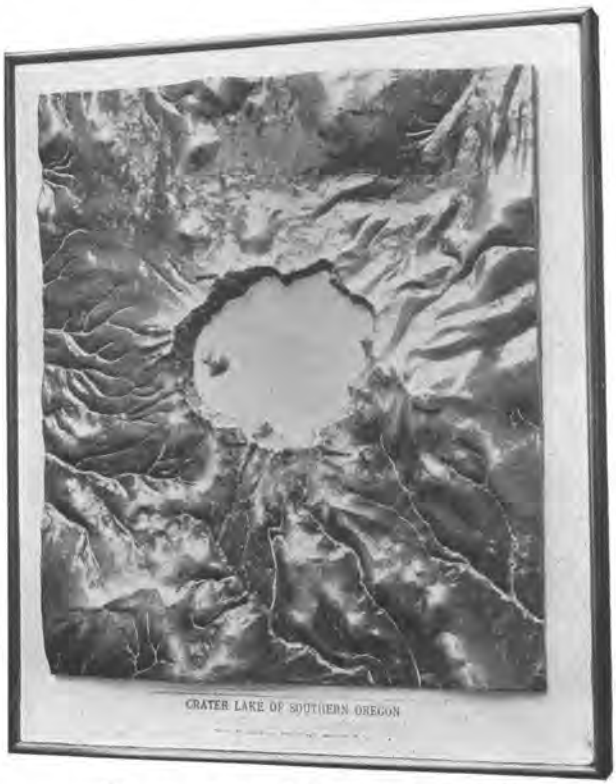
Price $27.50



No. 27. Southern Appalachians

No. 51. Relief Map of Palestine. The history of this country can be properly understood only with the help of relief. Every Sunday School should have one. Size 37 in. by 53 in. Scale, 4 miles equals 1 inch. Vertical exaggeration 3:1.

Price $50.00



No. 13. Crater Lake (see page 181).

No. 102. Relief map of Vesuvius, showing a section of the crater. Size, 2 feet five inches by two feet. In two sections.
Price $25.00

No. 111. Relief Map of the Henry Mountains and vicinity. 3 ft. 6 in. by 3 ft.
Price $75.00

No. 112. Stereogram of the Henry Mountains and vicinity. 3 ft. 6 in. by 3 ft.
Price $30.00

No. 113. Relief Map of the High Plateaus of Utah. 4 ft. 8 in. by 4 ft. 10 in.
Price $100.00

No. 114. Relief Map of the Mining District of Leadville, Colorado. 2 ft. 8 in. by 3 ft. 2 in.
Price $125.00

No. 116. Relief Map of the Yellowstone National Park. 4 ft. 4 in. by 5 ft. 2 in.
Price $150.00

No. 117. Relief Map of the Yosemite Valley. 4 ft. by 6 ft.
Price $150.00

No. 118. Relief Map of the Yosemite Valley. 2 ft. 5½ in. by 4 ft.
Price $75.00

No. 119. Relief Map of the Eureka District, Nevada. 5 ft. 2 in. by 5 ft. 6 in.
Price $200.00

No. 120. Relief Map of Mount Taylor, N. M. 4 ft. 2 in. by 4 ft. 2 in.
Price $100.00

No. 121. Relief Map of the Uinta and Wahsatch Mountains. 4 ft. 2 in. by 3 ft. 11 in.
Price $150.00

B. REPRODUCTIONS OF ANCIENT CLIFF HOUSES

Pueblo de Taos, New Mexico

GR–151. Pueblo de Taos, New Mexico. W. H. Jackson, sculptor. Scale—one inch equals twenty feet. Size, three feet eight inches long by three feet four inches wide. This shows a walled city on a level plane, with a river running through it. The houses are one to four stories in height, with entrances through the roof, reached by ladders.
Price $100.00

Pueblo of Acoma, New Mexico

GR–152. Pueblo of Acoma, New Mexico. W. H. Jackson, sculptor. Scale—one inch equals fifty feet. Size, three feet nine inches by three feet six inches. This town is built on a plateau. The houses are at various points on the outskirts, and not improbably served as watch towers.
Price $100.00

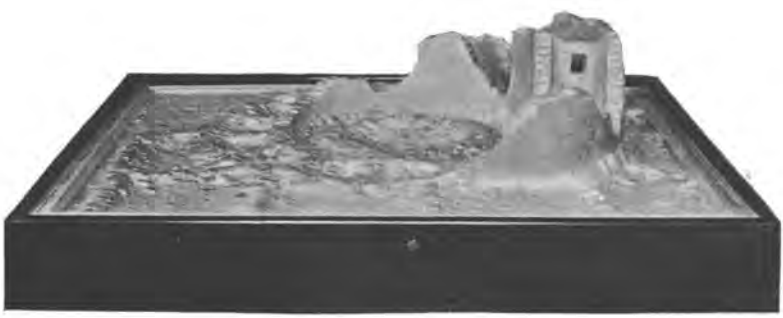
Pueblo of Tegua, Arizona

GR–153. Pueblo of Tegua, Arizona. W. H. Jackson, sculptor. Scale—one inch equals 12½ feet. Size, four feet by two feet six inches. This is one of the seven Moqui villages, and is built upon a mesa bordered by precipitous cliffs.
Price $100.00

Restoration of Pueblo Bonito

GR–154. Restoration of Pueblo Bonito, Chaco Canyon, New Mexico. Size, two feet seven inches by one foot nine inches. W. H. Jackson, sculptor. Scale—one inch equals twenty feet.

Price $150.00



Ruin of Ancient Tower, Southwestern Colorado

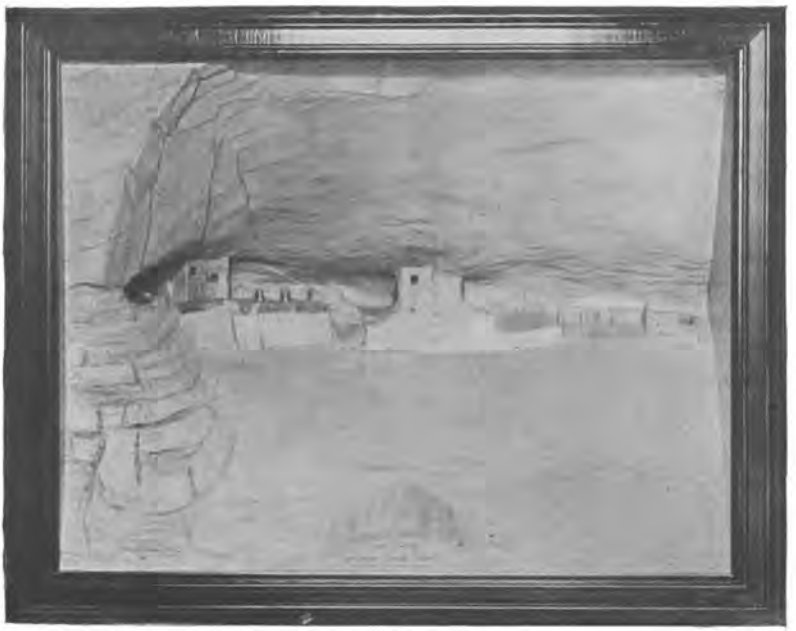
GR–155. Ruin of ancient tower, south-western Colorado. W. H. Holmes, sculptor. Scale—one inch equals two feet. Size—2′9″ square by 8″ high. This tower was built of three concentric circles of roughly hewn stone.

Price $50.00

"Montezuma's Well", Arizona

GR–156. Montezuma's well, near Camp Verde, Arizona. W. J. Hoffman, sculptor. Size—three feet eight inches by three feet three inches. This is a small lake bordered by perpendicular cliffs containing several cliff houses.

Price $75.00



Ruins of Rio de Chelly, Arizona

GR–157. Ruins of an ancient cave town, Rio de Chelly, Arizona. W. H. Jackson, sculptor. Scale—one inch equals six feet. Size—three feet nine inches long by three feet high by fourteen inches thick. (See cut.)

Price $75.00

GR–158. Restoration by Mr. Jackson of GR–157, to the same scale.

Price $100.00

GR–159. Cliff ruin in Mancos Canyon, Colorado. W. H. Holmes, sculptor. Scale—one inch equals two feet. Size—three feet nine inches high by two feet three inches wide by one foot thick. This cliff house contains only four small apartments.

Price $50.00

GR–160. Cliff Fortress, Arizona

GR–160. Ancient cliff fortress, Beaver Creek, Arizona. W. J. Hoffman, sculptor. Scale—one inch equals five feet. Size—three feet four inches high by two feet one inch wide by ten inches thick. This is an elliptical hole in a nearly perpendicular cliff, with a house built in it.

Price $50.00

GR–161. Ancient cliff ruin in the valley of the Rio de Chelly, Arizona. W. H. Jackson, sculptor. Scale—one inch equals three feet. Size—three feet seven inches high by three feet wide by one foot ten inches thick. A two storied house twenty feet in height built against the sloping wall of the bluff.

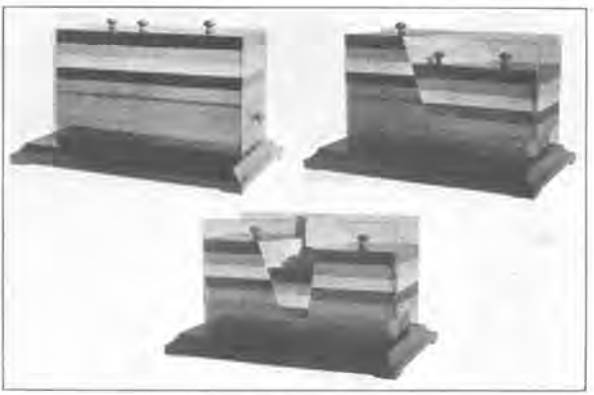
Price $50.00

GR–160. Animal mounds of Wisconsin. J. A. Lapham, sculptor. Many of the mound builders made their earthworks in the form of animals. Fourteen of the more notable ones of Wisconsin are shown on one placque. The animals represented are (1) the Man; (2) the Trunk and Arms; (3) the Buffalo; (4) the Long-armed Man; (5) the Otter; (6) the Bear; (7) the Horse; (8) the Mink; (9) the Bird; (10) the Eagle; (11) the Elephant; (12) the Broad-tailed animal; (13) the Squirrel; and (14) the Turtle. Size—six feet by three feet six inches.

Price $100.00

C. GEOLOGICAL MODELS

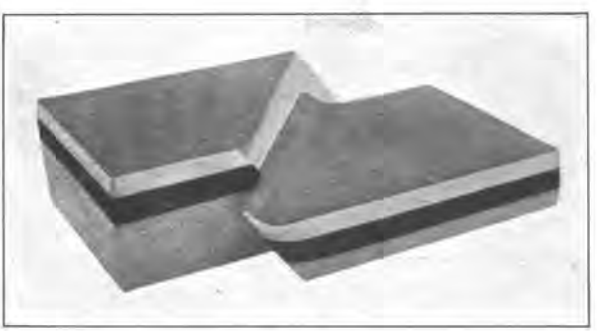
These models were prepared, at the suggestion of the Geological Society of America, to meet a very real need.



Model No. 1

Model No. 1. Model to illustrate normal faulting. This model is 18 inches long and 5 inches wide, and consists of a block of wood enclosed between glass plates. The block of wood is cut by two diagonal faults at right angles; and is so constructed that when the lower part of the block on the right is withdrawn a simple normal fault is produced, and when the lower block on the left is removed a second fault forms. (See Cut.)

Price $20.00



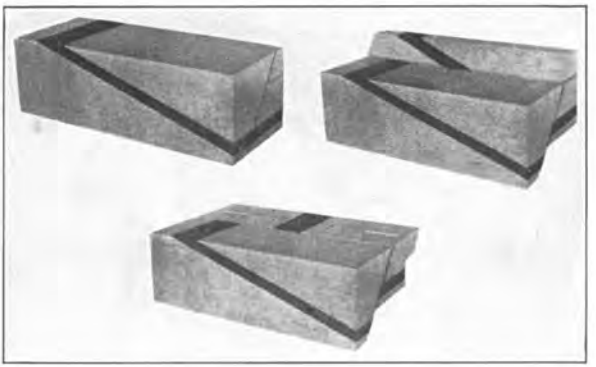
Model No. 2

Model No. 2. Model to show slip, dip slip, strike slip, net shift, and drag dip, constructed after the diagram in the report of the Committee on the Nomenclature of Faults (see Bulletin of the Geographical Society of America, Vol. 24, 1913, page 171). (See Cut.)

Price $15.00

Model No. 3. Model illustrating both normal and thrust faults on inclined beds. By turning back the hinged top of the back block the effect of erosion on a region so faulted is seen. This model is also useful in demonstrating horizontal faulting such as that which produced the San Francisco earthquake. (See cut, next page.)

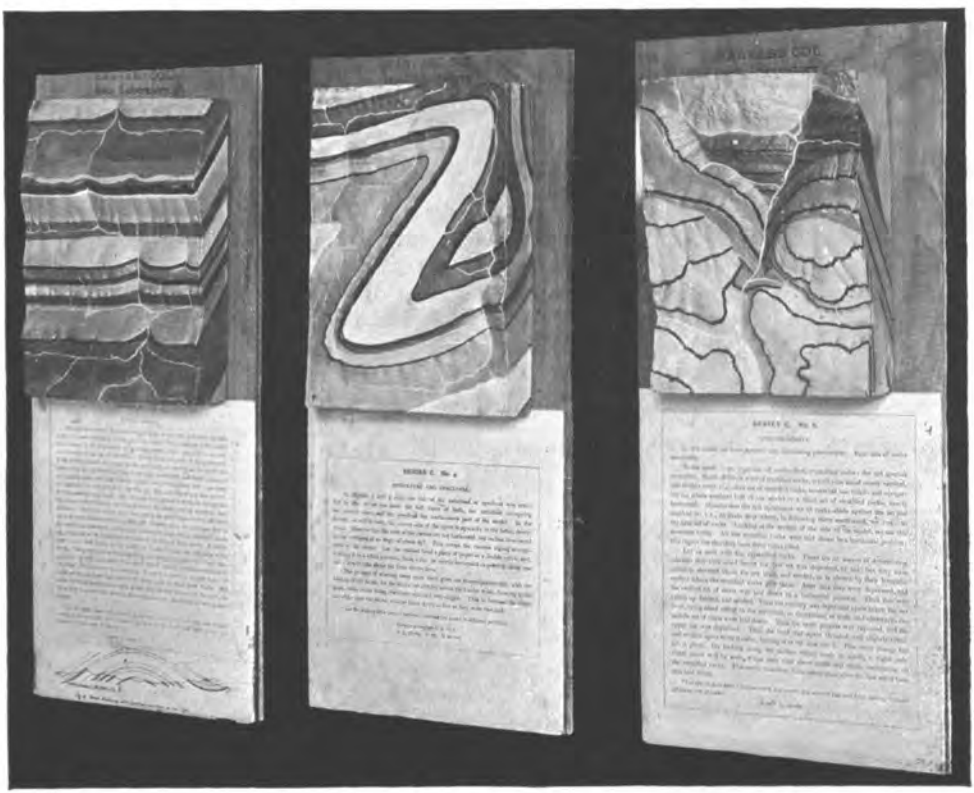
Price, packed for shipment $10.00



Model No. 3

SHALER-DAVIS-HARRIS MODELS AND PHOTOGRAPHS

Models No. 4. The Shaler-Davis-Harris Models and Photographs. 25 models and 20 photographs illustrating physical geology and physiography.



Series C No. 2 **Series C No. 4** **Series C No. 5**

Series D—Plate 2 Series A—Plate 5 Series D—Plate 4

This series, for which we have acquired the sole agency and manufacturing rights, grew out of the necessity experienced at Harvard University for practical models illustrating geological and physiographical phenomena, and embodies the results of many years of experience in teaching.

We know of no other models that can compare with these in clearness for conveying the exact information desired. They are of convenient laboratory size, 7 by 5 inches, mounted upon light and non-warping tablets, 14§ by 6§ inches, to which are also attached carefully prepared explanatory texts written by Prof. Shaler, one for each model. The series further includes twenty permanent photographs, 7 by 9 inches, of localities or phenomena that serve to elucidate the subjects. These are mounted upon muslin on wooden stretchers, 17¼ by 12½ inches, and bear explanatory labels. The models and photographs are intimately connected by cross references in their descriptions.

Series A. Volcanic action—4 models—6 photographs.

Series B. Earthquake action—1 photograph.

Series C. Stratification—5 models—2 photographs.

Series D. River erosion and building—6 models—6 photographs.

Series E. Coast erosion and elevation—4 models—2 photographs.

Series F. Coral reefs—2 models.

Series G. Glaciation—5 models—3 photographs.

For further description see circular No. 99.

Individual models, $5.00 each.

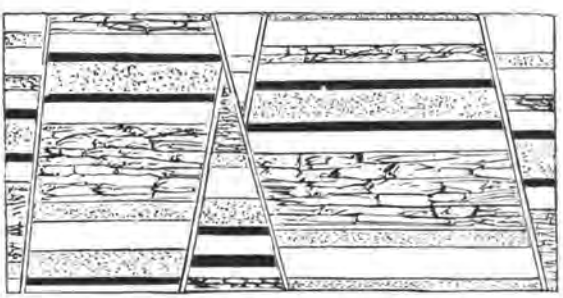
Individual photographs, $2.00 each.

Complete set in case, $150.00 f. o. b. Rochester, N. Y., with packing charged at cost.

Models No. 5. Sopwith Geological Models

The set was originally prepared by Thos. Sopwith, F. R. S., assisted by Buckland, Murchison, Lyell, De la Beche, and others. In their manufacture, the order of natural events which produced the phenomena illustrated by the models is followed step by step. Each model is at first a solid block of horizontal layers of variously colored woods. The displacements of the actual strata are then imitated by successively sectioning and faulting the blocks. It will be seen that this method of making the models precludes any possibility of inaccuracy.

They are in the main actual copies to scale of special mining regions, the different beds of rock being represented by different colored woods. The upper part of each model represents the surface of the ground, either actual or restored, the sides exhibit four vertical sections, and the base a horizontal plane at a certain depth under the surface, according to the scale of the model. Each model is separable into two or more pieces, to give an idea of the appearance that would be produced at certain depths by the oblique or horizontal removal of the surface.



The set consists of six models, as follows:

No. 1. Stratified Rocks and Valley of Denudation.

No. 2. Displacement of Strata.

No. 3. Surface Indications of Coal.

No. 4. Dislocation of Coal Strata.

No. 5. Intersection of Mineral Veins.

No. 6. Vertical Intersection of Mineral Veins.

To students in geology and persons interested in mining, these models afford a much clearer idea of geological phenomena than ordinary plans and sections, as they present a fac-simile of the objects represented, and can be studied in every variety of position, thus exhibiting and explaining the subterranean as well as the surface relations of the various strata, beds of coal and mineral veins. A catalogue giving full explanations and calling particular attention to the different features illustrated by each model accompanies the series.

Neatly made cases are furnished with each set.

Six models, each 4 inches square $50.00

Six models, each 8 inches square 75.00

No. 6. Model of Faults. This model, approximately six inches square and three and one-half inches high, is carefully constructed of different kinds of wood, each wood representing a different stratum of rock. Portions of the model have been displaced so as to reproduce accurately the different faults which occur in nature. A horizontal section separates the model into two parts so that the structure at a corresponding depth is plainly and clearly presented. A vein of some material foreign to the strata is also shown, and this too has been faulted.

By means of this model a full and complete understanding may be given the students of such terms as "angle of hade," "heave," "throw," "displacement," "fault scarp" and so on, and he will learn the different types of "normal and reversed faults," including "strike faults," "dip faults," "thrust faults," etc., more effectively than would be otherwise possible.

This model gives in a concise form, easily handled and examined, information that is usually obtained only by means of pages of illustration.

Price, packed and ready for shipment, $10.00.

Model No. 7. Model of a Mexican Oil Field. This is Prof. Huntley's model of the Tepetate-Chinampa oil field, of which Prof. Cleland writes in the Bulletin: "This model is unusually well suited for demonstration purposes. It consists of a subsurface section showing the folding in the Tamasopa limestone, on the top surface of which is drawn the oil-water contact lines at different periods in the pool's history. The surface of the region is represented by a sheet of transparent celluloid on which is drawn the map of the region; wooden pegs represent the wells drilled." (See Cut.)

Model No. 7

Models No. 8. Contour. A series of five plaster models to aid the student in understanding contour maps and the making of relief maps.

No. 1 shows a valley, hill, etc. in relief.

No. 2. The same model with all above a certain elevation cut off by a horizontal plane.

Nos. 3, 4, 5. The same cuts at lower levels.

A very helpful series.

Price, packed for shipment $5.00

NO. 9. CURTIS GEOGRAPHY MODELS

The first naturalistic land relief made in this country was the Great Coral Atoll of Bora Bora constructed for Prof. Agassiz in 1907. This opened up a new field furnishing the most complete representation of the great forms and types of the earth's surface.

To fill the same place in the laboratory and class room, smaller naturalistic reliefs of like fidelity have been devised by Mr. Curtis, having in view the need in schools for illustrations in three dimensions, to aid the text books in making more real the form and color as seen in the landscape. His work with Prof. Davis on the models at Harvard showed him the value of such improved reliefs. The result is "The Curtis Geography Models," which stand in a class by themselves.

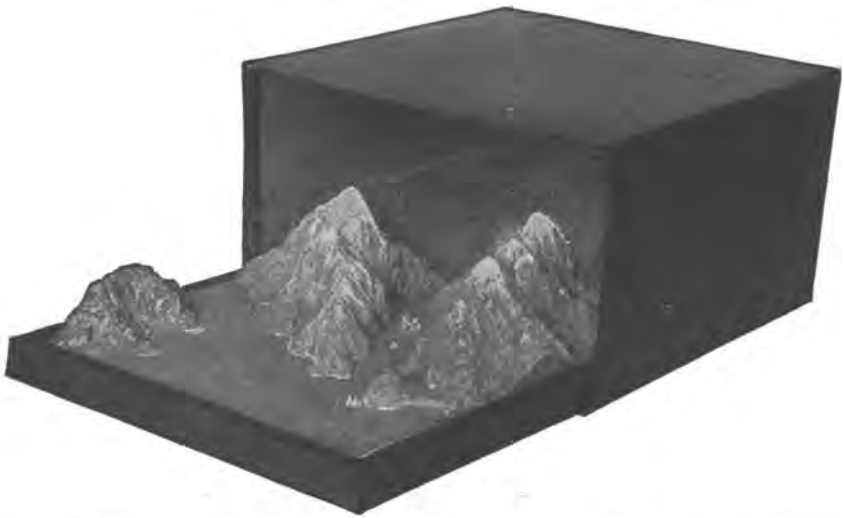
Teachers unused to these reliefs will be surprised at the results obtained, and will quickly recognize in them a great advance in livening and making real the study of Geography.

These models, six in number, are true scale reliefs representing actual configurations of the earth's surface, and showing their resultant position in the scheme of civilization. For example, Model No. 1, Sea Coast and Coastal Plain, shows a plain bordering the sea, cut by rivers. A harbor lies at the head of the bay, and a seaport is naturally located there to take advantage of the harbor and shipping facilities.

The models are as follows:

No. 1. Sea Coast.—A, Coastal Plain. Uplifted sea bottom illustrating Peninsula, Bay, Isthmus, Promontory, Cape, Strait, Channel, Dunes, Seaport, etc.

No. 2. Sea Coast.—B, an Embayed Mountain Coast. Drowned shore line illustrating clearly Inlet, Lagoon, Sound, Delta, Mountains, Peaks, Divides, Bay Head Villages, etc.



No. 3. Volcanoes.—A, Cinder cone. Representing active crater, old and fresh lava, ashes, narrow valleys or canyons, cultivated fields (made by terracing the older lava slopes), barren slopes, etc.

No. 4. Volcanoes.—B, an open crater. Illustrating caldera crater, crater walls, crater lip, section of cone, lava flows, narrow valleys, lack of cultivation and habitations, etc.

No. 5. Glaciers.—A, Head of a glacier. Illustrating divides, ridges, steep rock slopes, large and small snow fields, large and small glaciers, ice cliffs, avalanches, etc.

No. 6. Glaciers.—B, Lower end of glacier. Illustrating foot of glacier, source of stream, ice fall, waste of land, moraines, mountain road, Alpine settlement, glacial lake, etc.

With the models is furnished the Manual, a text book prepared by Mr. Curtis for use with the models, giving a more detailed description of the features illustrated, as well as definite information as to their use for elementary geography, advanced geography or geology, and physiography.

Price of complete set of six models, with cases and Manual, $75.00

Manual only ..... .50

SECTION X.
MINERALOGY AND PETROGRAPHY

Ever since the inception of our business, our Department of Mineralogy and Petrography has been furnishing minerals and rocks for educational purposes. Today it does by far the largest business in this line of any house in the whole world. With a stock worth in the neighborhood of $300,000.00 and additions to it during 1928 of $132,000's worth, we are prepared to give the best of service to teachers, museums, research laboratories and students as well as private collectors. The following fourteen pages call attention to only a few of the lines of goods which we carry in stock, but it is hoped that they will enable us to bring to the attention of some who have not known of us our ability to furnish material for which they have searched in vain elsewhere. We shall be pleased to render any service in our power to mineralogist or petrographer, and we especially ask attention to the price-lists in this department mentioned below.

A. MINERALS

I. GOOD MINERALS

Quartz Twin; Province of Kai, Japan.

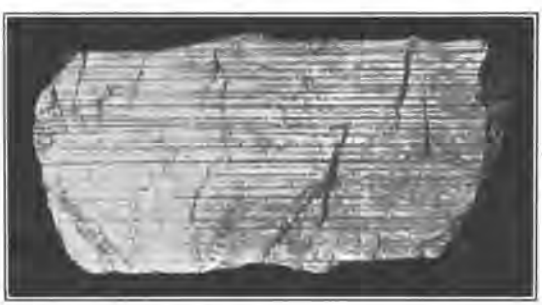
Price-List No. 291, entitled "Good Minerals." This is a unique alphabetical price-list of actual specimens in stock on November 1st, 1927. It gives sizes and briefly states the most important characteristics of the specimens. While many superfine specimens are included in this list, it is not a mere price-list of expensive specimens for there are mentioned in it excellent specimens of many common and low-priced minerals. Its unique feature is that only **GOOD** minerals are noted.

Should you send for this list, please bear in mind that any such list is soon out of date so far as it concerns the actual specimens mentioned, but it will give an excellent idea of the general character of our stock and serve as a basis for orders for good minerals. Since its publication the accessions to our stock have been very large and unusually important. Never before have we added to the stock so many extra fine specimens. It is not possible in any price-list to do justice to such specimens; they must be seen to be appreciated; therefore, we always prefer submitting them to customers on approval. Approval consignments of good minerals are sent (at customer's expense) to representatives of educational institutions authorized to purchase, and to others furnishing the customary business references.

Nowhere else can there be found a stock of fine and rare mineral specimens as complete nor as good as ours. It is our aim to carry in stock every obtainable species. While, of course, a great many species are not obtainable, there is never a time when we cannot supply a much more complete assortment of species and varieties than can be obtained elsewhere, and at lower average prices.

II. INEXPENSIVE MINERALS

Price-List No. 315, "Inexpensive Minerals." This list prices five different sizes of a great many minerals, the large majority of them being inexpensive. All specimens are thoroughly characteristic and well exhibit the properties of the minerals. The smaller sizes are especially for class-room or individual study; the largest two sizes are for display.



Oligoclase, N.C. showing twinning striae

Our enormous stock of minerals of educational value enables us to furnish every mineral for which there is a reasonable demand, and often we can supply a number of different varieties. Many teachers recognize the great importance of familiarizing the pupil with several varieties. This can be accomplished with ease by the aid of this price-list.

III. MINERALS SOLD BY WEIGHT

Price-List No. 314, "Minerals Sold by Weight." This price-list contains a classified list of about 300 species, in all classes of minerals, which we sell by weight. In the alphabetical list about 400 additional varieties are enumerated, thus enabling the teacher to select from a list of about 700 minerals those which are best adapted to his needs in the laboratory.

Buying by weight saves at least fifty percent. A great host of schools and colleges is numbered among our customers for this "pound material." We endeavor to secure the very purest and best material obtainable in any part of the world.

IV. PRECIOUS AND SEMI-PRECIOUS CUT STONES: GEMS

Price-List No. 299 will give some idea of the stones which we can furnish. While we do not carry a large or complete stock of gems, we always have many choice cut stones. We aim especially to secure mineralogical gems and unique stones such as are not ordinarily obtainable from jewelers. We call attention especially to our facetted fire opals, kunzite, morganite, orthoclase, yellow spodumene, tourmalines of many colors, wernerite, zircons of several colors.

B. ROCKS

Banded Biotite-Gneiss; Uxbridge, Massachusetts

Price-List No. 316, "Rocks." This enumerates approximately 550 rocks which we carry in stock, sufficient, we believe, to meet the needs of petrographers, teachers, students and prospectors.

Museum specimens are neatly trimmed to standard size, 3 x 4 inches, where material permits, are accompanied by a printed label and are sold at the uniform price of 50 cents each.

Student specimens are supplied in chips of varying sizes at 10 cents and 15 cents each. They are of great service for laboratory work and field comparison.

Rocks are now sold by the pound, for the convenience of teachers who wish considerable material at as low prices as possible, to distribute to their classes. The usual prices are 10 cents, 15 and 20 cents, with the minimum quantity of each kind not less than two pounds.

Collections of Rocks are described on pages 200 and 201.

C. COLLECTIONS OF MINERALS AND ROCKS

SELECTED FROM

THE 178 COLLECTIONS DESCRIBED IN PRICE-LIST 318

Ever since the inception of our business, Ward's has specialized in collections. There is scarcely a museum of standing anywhere throughout the world to which some of Ward's collections have not been sold.

Owing to our policy of keeping our stock right up to date, the collections now being put up are far superior to the earlier ones.

One feature to which we would call attention is that the large majority of our collections are arranged to illustrate specific text-books. The teacher is thus enabled to bring into the lecture room or laboratory exactly the material needed to elucidate the subject in hand.

Price-List No. 318 is sent free on request to anyone interested.

I. CRYSTALLOGRAPHY

Our "Dana Collections of Natural Crystals" owe their popularity with advanced students and teachers of crystallography to the accompanying descriptive catalog of forms and to their careful selection. The prices range from $16.00 to $200.00. **D. Cr. 2** consists of 100 crystals, each in tray 1 x 1 inch, in oak case, with catalog giving name of mineral, locality, crystal system, class, type and also the names of the individual faces on each crystal, **$100.00.**

"Dana Collection of Twin Crystals," D. Cr. 8, illustrates pages 160–172 of Dana's "Text-Book of Mineralogy," and consists of 36 specimens, mostly loose crystals, each in tray 1⅞ x 1⅛ inches, in polished oak case, with catalog of forms; **$35.00.**

"Dana Collection Illustrating Irregularities of Crystals," D. Cr. 9, is a vivid visualization of pages 171–181 of Dana's "Text-Book of Mineralogy;" its 36 specimens are each in tray 1⅞ x 1⅛ inches, in oak case, with catalog of forms; **$35.00.**

"Dana Collection of Crystal Aggregates," D. Cr. 10, makes wonderfully interesting two dry pages in Dana's "Text-Book of Mineralogy" and enables a student easily to remember many important definitions. It consists of 40 specimens, averaging 2½ x 2½ inches, in "Ward" improved trays; **$50.00.**

"Dana Collection of Pseudomorphs," D. Cr. 11, consists of 15 specimens averaging 1½ x 2½ inches, in "Ward" improved trays, and well illustrates pages 183, 184, 326 and 327 of Dana's "Text-Book of Mineralogy;" **$15.00.**

II. PHYSICAL MINERALOGY

We put up 14 excellent collections to illustrate the various physical properties of minerals as noted on pages 185–199, 247–251 and 303–310 of Dana's "Text-Book of Mineralogy."

Our collection **Ph. Min. 1** combines into one comprehensive collection all of the minerals included in the others. It consists of 225 specimens, averaging 2½ x 2½ inches, mounted in "Ward" improved trays, (as shown on page 197); **$225.00.** It is one of the most instructive collections we have, and splendidly illustrates Cleavage and Parting, Fracture, Hardness, Tenacity, Specific Gravity, Diaphaneity, Color, Luster, Miscellaneous characters Depending on Light and Heat, Electricity and Magnetism and Taste, Odor and Feel.

Hardness Collections are essential to a proper understanding of this subject and greatly assist in determinative mineralogy. Collection **Ph. Min. 6** (page 199) consists of 9 specimens, each in tray 1½ x 1½ inches, all in oak box, **$2.50,** or, with the addition of a small diamond crystal, **$3.50.**

Collection Ph. Min. 6 (See page 198).

III. CHEMICAL MINERALOGY

Our series of seven **"Blowpipe Collections,"** ranging in price from $2.50 to $20.00, leaves nothing to be desired in the way of small fragments for laboratory determination with the blowpipe.

Collection B–P 2 comprises 50 of the most important species mentioned in Brush-Penfield's "Determinative Mineralogy and Blowpipe Analysis," each in tray, 1 x 1 inch, in oak box; **$6.50.**

B–P 3, 100 species, including all but the very rarest mentioned in Chapter III, each in tray 1 x 1 inch, in oak box; **$10.00.**

M. & P. 1 consists of 100 of the most important species described in Moses and Parsons' "Mineralogy, Crystallography and Blowpipe Analysis," each in tray 1 x 1 inch, in oak box; **$10.00.**

In co-operation with Prof. G. M. Butler, we have put up two collections to illustrate his "Pocket Handbook of Blowpipe Analysis." The specimens are in trays 1 x 1 inch enclosed in clothboard boxes. **BB. 1, 35 specimens, $2.50; BB. 2, 49 specimens, $3.50.**

We also call attention to the large number of minerals we sell by weight for blowpipe analysis and laboratory experimentation, as noted elsewhere.

IV. DESCRIPTIVE MINERALOGY

Our "Dana Systematic" Collections, nine in number, are our most scientific collections of minerals. They range from $24.00 to $6000.00. Evenly illustrating both Prof. E. S. Dana's monumental work, "A System of Mineralogy" and Prof. Ford's latest revision of Dana's "Text-Book of Mineralogy," they will be found to be the best all-around collections for study or museum display. **D. Sys. 1 consists of 216 specimens,** each in tray 1 x 1 inch, in oak case; **$24.00. D. Sys. 2** has 216 specimens, each in tray 1½ x 2 inches, in six clothboard boxes; **$45.00. D. Sys. 8** includes 640 specimens averaging 3 x 4 inches in "Ward" improved trays; **$1200.00. D. Sys. 10** is our largest regular stock collection, consisting of 2000 specimens of museum size (averaging 3 x 4 inches) in "Ward" improved trays. (see cut.) **Price $6000.00.**

Agate Mounted in "Ward" Improved Tray

Any museum would be proud to own this wonderful collection, indeed it is a mineralogical museum in itself. A goodly number of extra-large size museum specimens of much beauty and merit are always included. This collection is only put up to order, so that it is possible for us to include the very latest finds and also develop it to meet the particular needs of the buyer.

Owing to the vastness and completeness of our stock it is possible for us to equip a new museum with a much larger collection than the foregoing, adapting it to the space allotted and the ideas of the curator. We shall be pleased to discuss details.

Our "Dana-Ford" Collections illustrate Prof. W. E. Ford's latest revision of Dana's "Manual of Mineralogy." There are eight collections in this series, ranging from $5.00 to $225.00. **D–F 3** is one of the most popular, consisting of 128 specimens (Ford's entire list) each in tray 1⅛ x 1½ inches, in two clothboard cases; **$12.00. D–F 6** consists of 216 specimens (Ford's entire list and many varieties), each in pasteboard tray 1 x 1 inch, in oak box; **$25.00. D–F 8** is the largest of the series, being designed for museum display, with its 216 specimens averaging 3 x 4 inches, each in a "Ward" improved tray, with visible label, as illustrated on page 200; **$225.00.**

Our "Dana" Collections illustrate Prof. E. S. Dana's admirable, elementary book, "Minerals, and How to Study Them." There are five of them. **E. S. D. 2** consists of 36 specimens, each in tray 1½ x 2 inches, in clothboard case, **$5.00. E. S. D. 4** has 125 specimens, averaging 1½ x 2½ inches, unmounted, accompanied by printed labels; **$40.00.**

Our "Kraus and Hunt" Collections illustrate the authors' admirable text-book "Mineralogy." There are five collections in the series, ranging from $17.50 to $500.00. **Collection K. & H. 5** is a splendid museum collection of 360 specimens of standard size (3 x 4 inches), including all the species described and very many varieties, mounted in "Ward" improved trays; **$500.00.**

Our "Rogers" Collections, illustrate Prof. A. F. Rogers' "Introduction to the Study of Minerals." There are four collections in the series. The largest of these consists of 300 specimens, all mentioned in the book and many varieties, averaging 3 x 4 inches in "Ward" improved trays, **$350.00.**

V. PHYSICAL GEOGRAPHY

Our Price-List of Collections (No. 318) lists seven illustrating Physical Geography. These collections are in three series.

New York State Physical Geography Collections illustrate the State Education Department's "Syllabus in Physical Geography" for Secondary Schools, 1929 edition. **N. Y. 1** consists of 36 specimens each in tray, 1½ x 2 inches, in black clothboard box, **$3.00. N. Y. 3** is for the lecture room or museum and consists of 75 specimens, averaging 3 x 4 inches, in "Ward" improved trays, **$40.00.**

Prof. R. S. Tarr's "New Physical Geography" is illustrated by two collections: **T. 1,** 64 specimens, each in tray 1⅛ x 1½ inches, in black clothboard box, **$4.00. T. 2,** 64 specimens, averaging 2½ x 2½ inches, in "Ward" improved trays, **$15.00.**

Prof. T. C. Hopkins' "Elements of Physical Geography" is well illustrated by collection **T. C. H. 1,** 64 minerals each in tray 1⅛ x 1½ inches, in black clothboard box; also 36 rocks each in tray 1½ x 2 inches, in same size box; complete collection of 100 specimens, **$8.00.** Collection **T. C. H. 2,** consists of the same specimens but averaging 2½ x 2½ inches, in "Ward" improved trays, **$25.00,** in clothboard box, **$4.00.**

VI. ELEMENTARY COLLECTIONS OF MINERALS AND ROCKS

Our Boy Scout Collection No. 1, consists of those 25 minerals (averaging 1 x 1 inch), and 10 rocks (averaging ¾ x 1½ inches) with which, all things considered, it is most important for the boys to familiarize themselves by actual study and test. The specimens are numbered to correspond with label list, wrapped and merely enclosed in a bag, **$1.00.**

Our Boy Scout Collection No. 4, is our next larger collection, consisting of 50 minerals and 20 rocks of the same size as No. 1, **$2.50.**

There are other Boy Scout Collections, of larger specimens, for preservation in the cabinet or museum, at **$12.50, $62.50 and $125.00.**

Our Washington School Collections have been deservedly popular for a great many years and many thousands of them have been sold. There are three collections each of 40 specimens, each in a pasteboard tray, 2 x 2½ inches, enclosed in a clothboard case, printed label list on the lid.

Collection W. S. 1 consists of 40 minerals; **W. S. 2** has 20 minerals and 20 rocks; while **W. S. 3 is 40 rocks.** The price of either collection is **$5.00.**

Our Bennett Collections illustrate Prof. L. F. Bennett's "Rocks and Minerals." There are three of them. **L. F. B. 2** consists of 40 minerals and 40 rocks, in two cases, similar to the Washington School Collections, $10.00.

Our Crosby Collections illustrate Prof. W. O. Crosby's "Common Minerals and Rocks." There are five collections in this series, ranging from **$4.00 to $25.00. W. O. C. 4** embraces 150 specimens, averaging 1½ x 2½ inches, unmounted, **$25.00. W. O. C. 8** is the same in numbered fragments, in a bag, **$4.00.**

VII. GENERAL GEOLOGY

Under this heading there are listed in our Price-List No. 318, 30 collections, including some of the most important we prepare, and ranging in price from $1.00 to $250.00.

Our Hobbs Collections illustrate Prof. W. H. Hobbs' "Laboratory Course in General Geology." H. 1 consists of 64 minerals, each in tray 1⅛ x 1½ inches, in a clothboard box; also 36 rocks, each in tray 1½ x 2 inches, in same size box; complete collection, 100 specimens, **$8.00.** There are two larger collections at **$25.00 and $60.00.**

Our two collections of **Rock-Forming Minerals** are arranged to illustrate Chapter IV. of Prof. L. V. Pirsson's "Rocks and Rock Minerals," and are very popular. **R. F. 1** consists of 100 specimens, averaging 3 x 4 inches, in "Ward" improved trays, **$75.00; R. F. 3** has the same minerals with size averaging 1½ x 2½ inches in "Ward" improved trays, **$30.00.**

Price-List No. 208 describes the three collections which we put up to illustrate Chapters I and II of Lyon, Fippin and Buckman's "Soils, their Properties and Management." These collections are the result of the kind co-operation of Prof. Buckman who informed us of the exact minerals and rocks used in the course in the department of soil technology of Cornell University. Large numbers of teachers of Agriculture and many students have purchased these collections. There are three of them: **S–F. 1** is for museum or class room display, and consists of 82 specimens, averaging 3 x 4 inches, mounted in "Ward" improved trays, **$50.00. S–F. 2** consists of 41 specimens (those given to the students at Cornell), averaging 2 x 2 inches, unmounted; **$4.00. S–F. 3** is the same as S–F. 2 but in small chips, numbered to correspond with an accompanying label-list; **$1.50.**

We list five **Petrologic Collections of Rocks** in Price-List No. 318, and eight **Petrographic Collections.** Of the latter the most popular is **our famous "Clark Collection," Pet. R. 3,** consisting of 125 neatly trimmed specimens, 3 x 4 inches, in "Ward" improved trays, accompanied by a printed catalog descriptive of the rocks and the set of slides below mentioned, **$70.00. The set of slides, Pet. R. 3S,** will be found of very best workmanship and of extraordinarily large size sections, though the complete slide is of the American standard size, 1 x 2 inches. The slides are in five boxes, **$156.50.** The text of the catalog is by R. W. Clark, recently of the University of Michigan, and we believe that, equipped with the catalog, rocks and slides, any professor or student will find himself possessed of the very greatest aids yet prepared for the study of petrography. For the accommodation of those who prefer to make their own slides we put up a collection of small labeled chips of the same rocks, **Pet. R. 3D,** for which we ask **$5.25.**

Another collection, **Pt. R. 1,** which we are now able to offer, as the result of our recent expedition around the world, is a series of 10 platiniferous and palladiniferous ores and associated rocks from the great deposits in the Transvaal. The series consists of specimens trimmed to standard size, 3 x 4 inches, and mounted in "Ward" improved trays; **$10.50.** Accompanying it, though obtainable separately, is a collection of slides of thin sections of the same rocks, of the same large size and superior workmanship as our present "Clark" collections. Order **Pt. R. 1S, $12.50.**

Our Genetic Collections of Rocks are arranged in accordance with Grabau's "Principles of Stratigraphy." The larger collection, **G. R. 1,** consists of 110 rocks trimmed to standard size, 3 x 4 inches, in "Ward" improved trays; **$60.00. G. R. 3** consists of the same rocks, roughly trimmed to 1½ x 2½ inches, in "Ward" improved trays; **$22.50.**

Our "Stratigraphic Collections of Rocks" are arranged by Prof. George H. Chadwick, in accordance with current usage in the best American and European text-books, particularly those shown in comparative form by the United States Geological Survey on Plate I of their Bulletin 769, forming a table of "Geologic Time Classification." The collections are brought right up to 1929 and we believe they are the best ever put up. We believe that our collection **Str. R. 1** is the best stratigraphic collection obtainable. It consists of 250 trimmed specimens, 3 x 4 inches, in "Ward" improved trays; **$200.00. Collection Str. R. 3,** splendidly illustrates the stratigraphy of New York State, being made up of 125 rocks from that state of standard 3 x 4 size in "Ward" improved trays; **$100.00.**

Phenomenal Geology is well illustrated by our collection **Ph. Geol. 1,** 83 specimens, necessarily of varying sizes, but mostly large museum specimens, on blocks (see page 203), **$80.00.**

Orbicular Granite Mounted on Hard Wood Block

VIII. ECONOMIC GEOLOGY

We are proud of our series of 33 collections illustrating Economic Geology. They are listed in full in Price-List No. 318, to which reference should be made for further information.

Our "Ward Complete Technological Collection," Ec. Geol. 3, is the largest of the series of economic collections, including 700 specimens, averaging 3 x 4 inches, in "Ward" improved trays, **$1100.00.** This collection carefully combines into one, with elimination of duplicates, the following collections; Ward Collection of Ores and Economic Minerals; Rough Precious and Semi-Precious stones; Abrasives; Materials used in Glass Making and the Ceramic Industries; Mineral Paints and Materials Used in Color-Making; Cement, Mortar and Refractory Materials; Minerals Used in the Chemical Industries; Soils; Fertilizers and Their Derivatives; Fuels and Useful Hydrocarbons; Paving Materials. Accompanying the collection is a Catalog elaborately indexing its specimens alphabetically, chemically and industrially. This catalog is invaluable to the teacher of Economic Geology, for by its aid materials used by any industry, or ores of any element may be quickly selected from the collection. No up-to-date teacher of economic geology can afford to be without this collection.

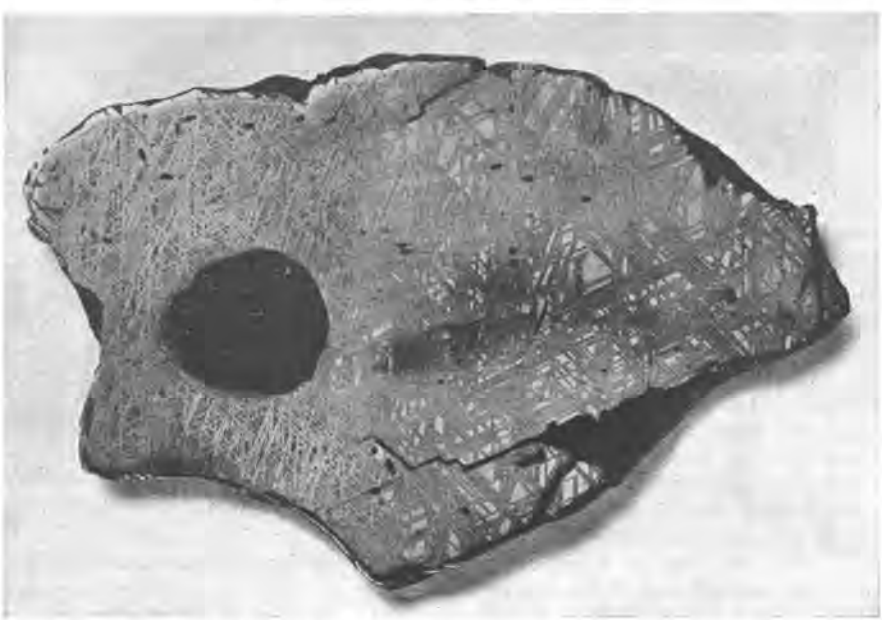
A few of our other excellent economic collections are: **Ec. Geol. 7, Ores of the Precious Metals** (Gold, Silver and elements of the Platinum group), 50 specimens, averaging 1½ x 2½ inches, in "Ward" improved trays, **$125.00. Ec. Geol. 8, Copper Ores and Minerals,** 50 specimens, averaging 3 x 4 inches in "Ward" improved trays, **$100.00. Ec. Geol. 10, Iron Ores and Minerals,** 50 specimens, averaging 3 x 4 inches, in "Ward" improved trays, **$50.00. Ec. Geol. 27, Abrasives,** 25 specimens, averaging 3 x 4 inches, in "Ward" improved trays, **$17.50. Ec. Geol. 37,** Soils, 20 specimens, each in quarter-pint glass show-bottle (see cut), then in "Ward" improved trays, **$12.00. Ec. Geol. 40, Fuels and Useful Hydrocarbons,** 40 specimens, averaging 3 x 4 inches, in "Ward" improved trays, **$25.00. Ec. Geol. 45, 100 polished slabs of Marbles,** about 4 x 6 inches, mounted in "Ward" improved trays, **$125.00.**

IX. PROSPECTOR'S COLLECTIONS

Realizing the inestimable value to Prospectors of having with them in the field accurately labeled specimens of many different minerals, we have put up with the greatest care, a series of 13 collections which are described in Price-List No. 318, which will be sent free on request. The largest of these collections is designated **Pros. 1,** and consists of 432 small specimens of minerals, each in a tray 1 x 1 inch, in two strong oak cases, **$100.00.** The collection embraces all important ores of the metallic elements and minerals of rich metallic content, also all of the most important minerals containing the non-metallic elements of commercial importance. Specimens are small so as to weigh as little as possible, and the two cases can be taken into the field. The exceptional completeness of this collection and the excellence of the little specimens are points which every prospector of intelligence will appreciate.

For prospectors who are interested in seeking for certain particular minerals we have collections of various kinds at prices ranging from $4.00 to $50.00, each of which is put up in a strong oak case. See Price-List No. 318.

D. METEORITES



Duchesne, Utah Meteorite. Polished and etched section of 835 grams.

Price-List No. 312, Meteorites in Stock March 15, 1929, enumerates 111 falls of meteorites in stock on that date, giving name, locality, condition, weight and price of a large number of specimens, both rough and polished.

Our purchase, a short time since, of the well-known **"Rochester Collection of Meteorites"** enables us to offer at present some exceptionally fine and rare, large, polished and etched slabs of iron meteorites at unusually low prices.

Several new meteorites were secured during our recent around-the-world expedition, and others have been obtained since.

We are always alert for opportunities of securing desirable meteorites and can supply, either singly or in collections, thoroughly representative specimens in the various groups, at prices ranging from 25c to $450.00.

E. CRYSTAL MODELS AND APPARATUS

We have the exclusive sale in the United States and Canada of the crystal models and supplies manufactured by the house of Dr. F. Krantz of Bonn, Germany, recognized for a century as the very best. **Our own Price-List No. 243, "Crystal Models and Apparatus,"** briefly describes many of these. They are treated under the following headings:

I. Crystal Models of Pear-Wood. 14 collections, ranging from one of **30 models at $10.35** to one of **928 models, $988.00**; all 5 cm. size. (Can also be furnished in 10 cm., and will be glad to give quotations on request).

II. Crystal Models of Glass. 15 collections, ranging from one of **15 models, at $20.70** to one of **139 models, $357.00.**

III. Crystal Models of Cardboard. 4 collections, ranging from one of **30 models, $36.90** to one of **520 models, $607.00.** (This larger collection is not listed in our Price-List, but in one of Dr. Krantz's catalogs).

IV. Miscellaneous Crystallographic Models, including (a) Model for the demonstration of **spherical projection of crystals, $38.55** (b) **Rubber ball model** for demonstration of the spherical projection of crystals, **$7.50** (c) Models for the demonstration of **the symmetry of crystals,** a set of **5 wooden models, $41.40** (d) 8 models of the **optical indicatrix, $214.25** (e) Set of six models of the surfaces of **optic waves, $43.80** (f) 6 models of the systems of **crystallographic axes, wood, 25 cm., $9.00; metal 50 cm., $35.70** (g) **Crystallographic Kaleidoscope, 8 models, $188.00.**

N.B.—The above prices are F.O.B. Bonn, Germany, and to them must be added our handling charge of 15%, plus actual cost of packing and transportation from Bonn to destination, and customs duty, if any.

CELLULOID MODELS OF CRYSTALS

Price-List No. 317 describes briefly a series of six models of crystals made of transparent celluloid, each representing a fundamental form in one of the crystal systems. The models also show various derivative forms by means of included transparent models with red borders, and the axes are represented by various colored silks, the same axis being shown by the same color. These models have been manufactured by this Establishment for many years and are deservedly popular. Price of the **six, in case, $25.00; mounted on blocks, $22.00.**

F. MINERALOGICAL SUPPLIES

Our Mineral Supply List, Price-List No. 292, enumerates many articles which are constantly needed by teachers, students and collectors, and which are not ordinarily carried in stock by other houses. There are noted below only a part of these items.

BOXES: Glass-top, rectangular. Cardboard, glazed bronze binding with white lining, reinforced.

	Size of Top	Depth	Per 10	50	100	500
R-1	1¼ x 1¾ inches	1 inch	$1.00	$ 5.00	$ 9.00	$ 45.00
R-2	1¾ x 2½ inches	1 inch	1.05	5.25	9.50	47.50
R-2½	1¾ x 2½ inches	1½ inch	1.25	6.25	11.25	56.50
R-3	2½ x 3½ inches	1 inch	1.50	7.50	13.75	68.75
R-3½	2½ x 3½ inches	1½ inch	1.55	7.75	14.50	71.75
R-4	3½ x 5 inches	1½ inch	2.15	10.75	20.50	103.00
R-5	5 x 7 inches	2 inch	3.35	16.75	32.50	162.00

(Quotations on request for 1000 or more.)

CRYSTAL HOLDERS:

Brass ..... 1½ inches long, 12½c each; $1.40 dozen.

CRYSTAL STANDS: Wood, either ebonized or natural wood polished, for mounting loose crystals and small mineral specimens:

No. 1 Broad bowl ..... 15c each; $12.00 per hundred.
2 Medium bowl ..... 15c each; 12.00 per hundred.
3 Straight stem ..... 15c each; 12.00 per hundred.
4 Solid tip ..... 15c each; 12.00 per hundred.
5 Small bowl ..... 10c each; 8.00 per hundred.

GLASS SHOW BOTTLES: Round top, corked at bottom, for display of sands, soils, clays, etc.: ¼ pint size, 25c each; $20.00 per 100.

GLASS VIALS: Fitted with corks.

	Per Doz.	Per Gross
No. 1 Round bottom, size 7 x 37 mm.	$ .25	$ 2.50
2 Round bottom, size 13 x 51 mm.	.35	3.00
3 Round bottom, size 12 x 30 mm.	.30	2.75
4 Flat bottom, size 21 x 32 mm.	.55	5.00
5 Flat bottom, size 23 x 50 mm.	.65	6.00
6 Flat bottom, size 35 x 51 mm.	1.95	17.50

GONIOMETERS: Penfield, contact. (For further particulars, see Price-List, No. 29).

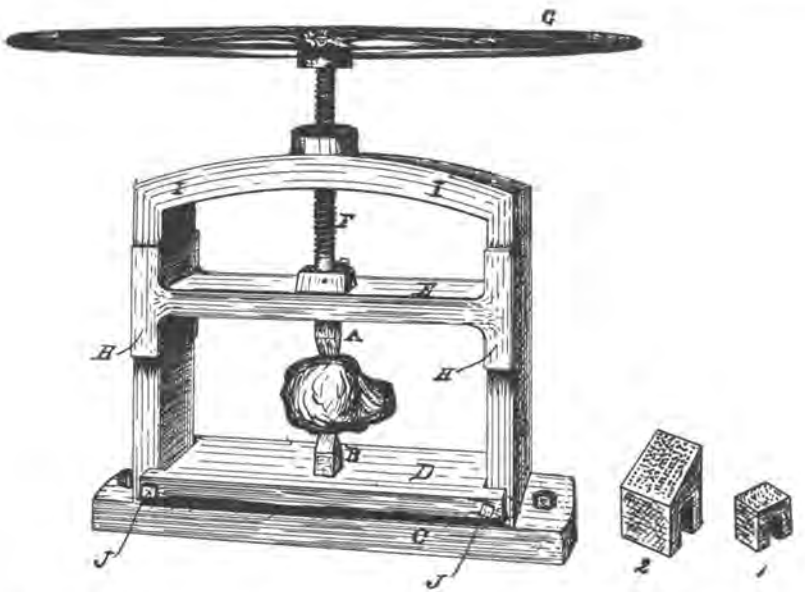
	Each	Per Dozen
Model A. Two sets of measuring arms and graduated semi-circle	$ .50	$5.00
Model B. Graduated semi-circle on card with measuring arms attached	.50	5.00
Model C. Arm protractor and goniometer	.50	5.00

HAMMERS: Mineralogical, cutting edge at right angles to handle.

No. 304, weight 12 ounces, price, $1.50 each.
562, weight 30 ounces, price, 2.75 each.
563, weight 22 ounces, price, 2.50 each.

PROSPECTING PICKS:

No. 1482, weight 24 ounces, price, $3.00 each.
1483, weight 16 ounces, price, 2.75 each.



MINERAL TRIMMER: For breaking minerals and rocks. The wheel, two feet in diameter, gives great leverage. We have two of these machines constantly in use and can recommend them highly. Price, each $100.00

STREAK PLATES: Unglazed porcelain, size 3½ x 1⅞ inches, price 15c each; $1.50 per dozen.

TRAYS: Pasteboard, for specimens; dark bronze binding, white inside.

No.	Outside dimensions.		Per 50	100	500	1000
A1	1½ x 1¾	½ inch high	$1.25	$2.00	$ 9.25	$18.50
A2	1¾ x 2½	½ inch high	1.30	2.10	9.75	19.50
A3	2½ x 3½	⅝ inch high	1.65	2.80	13.25	26.50
A4	3½ x 5	⅝ inch high	1.85	3.20	15.25	30.50
A5	5 x 7	⅝ inch high	2.30	4.10	19.75	39.50
B1	1½ x 2	½ inch high	1.25	2.05	9.50	19.00
B2	2 x 3	⅝ inch high	1.50	2.55	12.00	24.00
B3	3 x 4	⅝ inch high	1.70	2.95	14.00	28.00
B4	4 x 6	⅝ inch high	2.15	3.85	18.50	37.00
B5	6 x 8	⅝ inch high	2.80	5.15	25.00	50.00

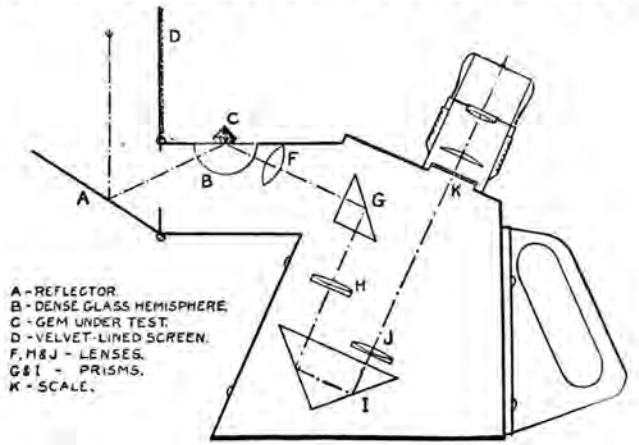
TRAYS: "Ward" Improved. These trays are provided with a ledge to which the label is fastened. They are particularly well adapted for use in displaying specimens in table cases or drawers, enabling both the specimen and label to be seen. Trays carried in stock have light blue binding and white lining.

No.	Front Sides*	Height	Per 50	100	500	1000
P1	3 x 2	⅝ inch	$3.00	$5.55	$27.00	$54.00
P2	3 x 3	⅝ inch	3.20	5.95	29.00	58.00
P3	4 x 3	⅝ inch	...	...	....	68.00**
P4	4 x 3½	⅝ inch	...	...	....	69.50**
P5	4½ x 3½	⅝ inch	3.90	7.25	35.50	71.00
P6	5 x 4	⅝ inch	...	...	....	76.00**
P7	6 x 4	⅝ inch	...	...	....	80.00**

(* This is the size of the actual opening for the specimen. The outside of the tray will measure one inch more due to the space occupied by the label ledge.)

(** These sizes only supplied in lots of 1000, and only made up on receipt of orders.)

G. THE TULLY REFRACTOMETER



The Tully Refractometer is the best and quickest instrument for the determination of the index of refraction of gems whose index is below 1.78. It is only necessary to place a drop of the oil which goes with the refractometer on the center of the hemisphere, then press a flat surface of the gem lightly down so that the liquid spreads out to form optical contact between the gem and the hemisphere. The index figure is then instantly read on the scale, and the identity of the gem is determined by comparison with the table accompanying the instrument.

We are the exclusive agents for the United States and Canada.

Price complete in mahogany case, with bottle of oil, **$115.00.**

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